

FLORIDA HIGHWAYS

Vol. IV

APRIL, 1927

No. 4

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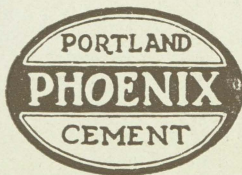
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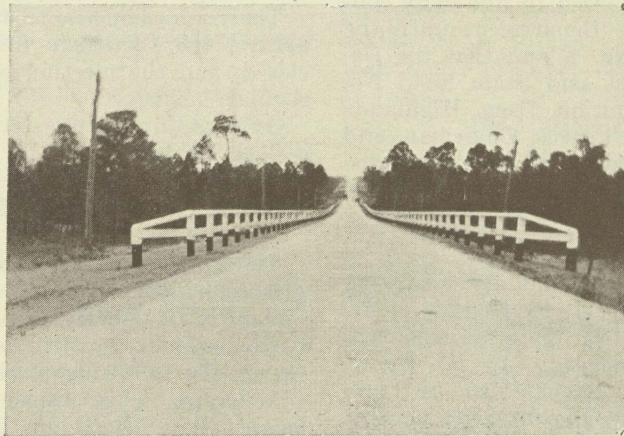
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FLORIDA HIGHWAYS



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Transactions at a Special Meeting of the State Road Department Held in Jacksonville, Florida, March 25th, 1927.

PURSUANT to call, a Special Meeting of the State Road Department was held in Jacksonville, Florida, March 25th, 1927, with all members present, to-wit: F. A. Hathaway, Chairman; E. P. Green, W. J. Hillman, J. Harvey Bayliss and I. E. Schilling. J. L. Cresap, State Highway Engineer; H. J. Morrison, Federal Highway Engineer, and B. A. Meginniss, Attorney for the Department, were also in attendance, the latter acting as secretary.

The reading of the minutes of the last regular meeting was dispensed with until the next quarterly meeting.

The Chairman announced that the primary purpose of the meeting was to hear complaints and suggestions from the public as to the Department's proposed budget of maintenance and construction work for 1927, as required by law. Thereupon, the roll of the counties of Florida was called and an opportunity given the public to present complaints and suggestions.

ALACHUA COUNTY

Major W. R. Thomas, Chairman Board of Bond Trustees, and Henry L. Baker, Engineer, of Alachua County were present and submitted a letter requesting the Department to take over for maintenance State Road 31 from Waldo to Island Grove, State Road 13 from Gainesville to the district line en route to Cedar Keys, and State Road No. 14 from Gainesville to Newberry and Fort Fannin; and the further request that the Department join Alachua County in requesting the Legislature to add to the State

system the road leading from State Road No. 2 via Worthington Springs to Lake Butler, and to take over for maintenance the last-named road.

DUVAL COUNTY

A. T. Brown, Dr. J. G. Rawls, H. J. Redavats, J. F. Hammond and W. P. Belote, members of the Board of County Commissioners, and John E. Mathews, County Attorney, presented the following suggestions from Duval County: (1) That the Department take over for maintenance all State roads within Duval County which have been constructed by the county; (2) That the Department place in the budget the construction of State Road 47, and (3) That the Department lend its assistance and co-operation to the effort to have the Legislature designate the Ocean Boulevard to Jacksonville Beach, and thence along the Atlantic Ocean to St. Augustine as a State Road.

ST. JOHNS COUNTY

At this juncture an opportunity was given Senator W. A. MacWilliams of St. Augustine to present to the Department a supplemental request that the Department accede to the petition of Duval County as to Roads 47 and Ocean Boulevard, as above set out, as the requests of the counties of Duval and St. Johns in these particulars are identical. The St. Johns delegation was as follows: Dr. J. N. Fogarty, Mayor of St. Augustine; Senator W. A. MacWilliams, County Attorney; C. A. Lamont, City Commissioner of St. Augustine; D. W. Osteen and L. P. Ortagus, County Commissioners; H. A. Felkel, Editor St.

Augustine Record; C. Samuel Jackson, County Manager; Eugene Masters, City Manager, St. Augustine, and H. H. Faver, Deputy Clerk Circuit Court.

HIGHLANDS COUNTY

Senator E. J. Etheredge, of DeSoto City, presented to the Department a request from Highlands County that the County Road now used as a section of State Road No. 8 be repaired and placed in first-class condition and maintained by the Department until the construction of State Road No. 8, and that the Department locate and construct said State Road No. 8 in the county. The delegation from Highlands County was as follows: L. C. Pearce, Chairman, and A. L. Butler, member, Board of County Commissioners; J. M. Lee, County Attorney; E. O. Douglas, Bond Trustee, and Senator E. J. Etheredge.

HILLSBOROUGH COUNTY

A delegation from Hillsborough County consisting of W. T. Williams, Chairman; J. R. Hendry, J. T. Gunn, J. N. Holmes and W. T. Watkins, members, Board of County Commissioners; A. B. Pimm, County Engineer, and T. M. Shackelford, Jr., presented two suggestions to the Department, namely, that the Department take over for maintenance that section of Road 5 in said county north of Tampa, and that portion of the same road between Tampa and Six Mile Creek.

NASSAU COUNTY

Judge J. B. Stewart, of Nassau County, requested that the Department commence construction on State Road No. 13 from Baldwin to Yulee as early as possible under existing statutes.

OTHER DELEGATIONS

Other delegations present at the meeting, who expressed satisfaction with the budget and complimented the Department on the work which it has done and is doing were as follows:

Bay County: L. E. Vickery, Chairman, and C. P. Russ, W. C. Holley and J. C. Gainer, members, Board of County Commissioners; J. Ed. Stokes, County Attorney; R. L. McKenzie, Treasurer Gulf Coast Highway Association; W. H. Marshall, Clerk Circuit Court.

Baker: Walter Dobbs; Dade: J. D. Redd, Member Board of County Commissioners; DeSoto and Glades: Senator E. J. Etheredge; Marion: Senator W. T. Gary; J. E. Walker, County Engineer; C. Ed. Carmichael, member, and Dr. J. G. Baskin, member Board of County Commissioners; Monroe: W. G. Blanchard; Pinellas: C. E. Burleson, County Engineer; Polk: Senator John J. Swearingen, and B. K. Bullard and Thomas W. Bryant, Members House of Representatives; Volusia: W. P. Wilkerson, Chairman Board of County Commissioners; N. A. Hotard, County Engineer, and C. B. Jones, Member Board of County Commissioners.

ESCAMBIA COUNTY—Road 1

On motion of Mr. Bayliss, seconded by Mr. Schilling, the following resolution was adopted:

Resolved, That there be and there is hereby added to the budget of construction work for the year 1927 that section of Road No. 1 between the Perdido Bridge and the end of the concrete pavement.

STATE ROAD NO. 18

On motion of Mr. Green, seconded by Mr. Bayliss, the following resolution was adopted:

Resolved: That State Road No. 18 be added to the budget of maintenance work for the year 1927.

REQUESTS FOR MAINTENANCE

On motion of Mr. Schilling, seconded by Mr. Bayliss, the following resolution was adopted:

Resolved: That all requests for taking over for maintenance of roads not constructed by the Department as submitted by the Counties at this meeting, be held for further consideration to afford the Department ample time to investigate the same.

There appearing no further business of a budgetary nature, the Chairman declared the budget hearing closed, and the meeting open for the transaction of regular business.

At this juncture a recess was taken until three o'clock for lunch.

AFTERNOON SESSION

Three o'clock.

The Department met pursuant to recess. Present as at morning session.

ALACHUA COUNTY—Road 14—Right of Way

On motion of Mr. Schilling, seconded by Mr. Green, the following resolution was adopted:

Whereas, This Department has surveyed and located State Road No. 14 in Alachua County between Gainesville and the Putnam County line, as is shown by plat of said location on file in this office, and on file in the office of the Clerk of the Circuit Court of Alachua County, a copy of which is hereto attached and marked "Exhibit A," and

Whereas, Said Department has found and determined and does hereby find and determine that it is necessary, wise and expedient to secure by purchase or condemnation the lands necessary for a right-of-way as shown by said plat; now, therefore,

Be It Resolved by the State Road Department of the State of Florida, That the County Commissioners of Alachua County, Florida, be and they are hereby requested and authorized to secure by purchase or condemnation the lands necessary for said right-of-way for said road along the line shown on said plat.

Be It Further Resolved, That said County Commissioners be and they are hereby authorized to use the name of this Department in any condemnation proceedings necessary to carry out the purposes of this resolution, or to proceed in their own name as authorized by law; and

Be It Further Resolved, That in the event that they shall elect to proceed in the name of this Department, that their attorney be and he is hereby authorized to prepare, execute and file all necessary pleadings, affidavits and documents in connection therewith.

VOLUSIA COUNTY—Road 4—Right of Way

Upon motion of Mr. Schilling, seconded by Mr. Green, the following resolution was unanimously adopted:

Whereas, This Department has surveyed and located State Road No. 4 in Volusia County between Port Orange and the Flagler County line, as is shown by plat of said location on file in this office, and on file in the office of the Clerk of the Circuit Court of Volusia County, a copy of which is hereto attached and marked "Exhibit A," and

Whereas, Said Department has found and determined and does hereby find and determine that it is necessary, wise and expedient to secure by purchase or condemnation the lands necessary for a right-of-way as shown by said plat; now, therefore,

Be It Resolved by the State Road Department of

the State of Florida, That the County Commissioners of Volusia County, Florida, be and they are hereby requested and authorized to secure by purchase or condemnation the lands necessary for right-of-way for said Road along the line shown on said plat.

Be It Further Resolved, That said County Commissioners be and they are hereby authorized to use the name of this Department in any condemnation proceedings necessary to carry out the purposes of this resolution, or to proceed in their own name as authorized by law; and

Be It Further Resolved, That in the event that they shall elect to proceed in the name of this Department, that their attorney be and he is hereby authorized to prepare, execute and file all necessary pleadings, affidavits and documents in connection therewith.

ORANGE COUNTY—Road 2—Right of Way

On motion of Mr. Green, seconded by Mr. Schilling, the following resolution was adopted:

Whereas, This Department has surveyed and located State Road No. 2, in Orange County, between Orlando and Plymouth, as is shown by plat of said location on file in this office, and on file in the office of the Clerk of the Circuit Court of Orange County, a copy of which is hereto attached and marked "Exhibit A," and

Whereas, Said Department has found and determined and does hereby find and determine that it is necessary, wise and expedient to secure by purchase or condemnation the lands necessary for a right-of-way as shown by said plat; now, therefore,

Be It Resolved by the State Road Department of the State of Florida, That the County Commissioners of Orange County, Florida, be and they are hereby requested and authorized to secure by purchase or condemnation the lands necessary for right-of-way for said Road along the line shown in said plat.

Be It Further Resolved, That said County Commissioners be and they are hereby authorized to use the name of this Department in any condemnation proceedings necessary to carry out the purposes of this resolution, or to proceed in their own name as authorized by law; and

Be It Further Resolved, That in the event that they shall elect to proceed in the name of this Department, that their attorney be and he is hereby authorized to prepare, execute and file all necessary pleadings, affidavits and documents in connection therewith.

MADISON COUNTY—Road 1

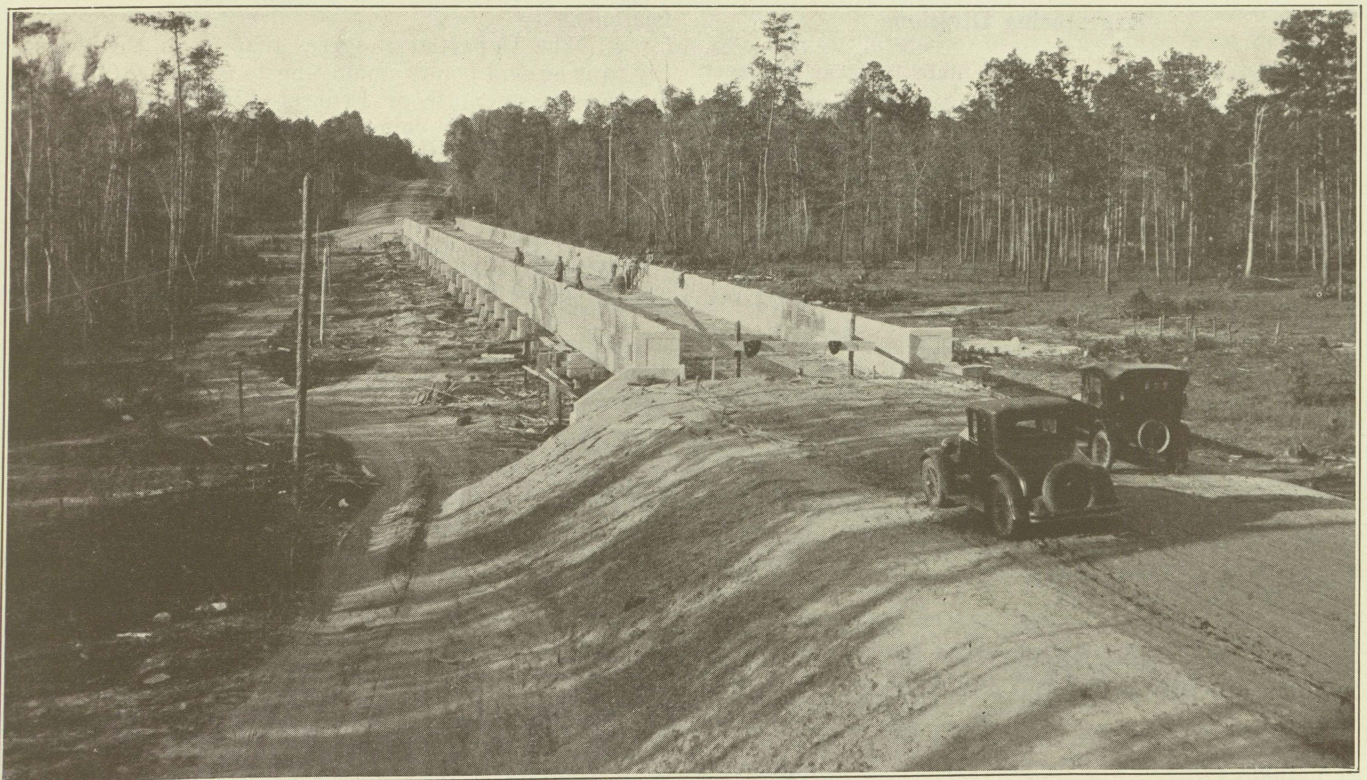
On motion of Mr. Green, seconded by Mr. Schilling, the following resolution was unanimously adopted:

Whereas, The following agreement was entered into between the Board of County Commissioners of Madison County and the State Road Department, to-wit:

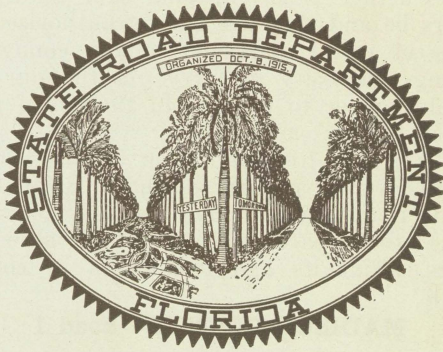
"This Agreement made this 1st day of July, 1926, between the State Road Department of the State of Florida hereinafter referred to as the Department, and the Board of Commissioners of Madison County, Florida, hereinafter referred to as the Commissioners, Witnesseth, that

"Whereas the Bonds of said County in the amount of \$241,000.00 have been duly authorized to be issued for the purpose of constructing a paved macadamized or other hard-surfaced highway in said county running from the bridge across the Suwannee River near Ellaville to the bridge across the Aucilla River on the Greenville-Monticello public road by way of Lee, Madison and Greenville, following as near as practicable said public road with such changes as may hereafter be designated by the Department, and

"Whereas it is desired by the Commissioners to transfer said bonds to the Department to aid in the construction of said road under the provisions of



Project 672. Road 1. Ocklocknee River Bridge Between Leon and Gadsden Counties.



Florida Highways

Published Monthly
Official Publication of the State Road Department

PERSONNEL OF DEPARTMENT

F. A. HATHAWAY (*Jacksonville*), *Chairman*
(*Official Residence, Tallahassee.*)

E. P. GREEN, *Bradenton*

W. J. HILLMAN, *Live Oak*

J. HARVEY BAYLISS, *Pensacola*

I. E. SCHILLING, *Miami*

WALTER P. BEVIS, *Tallahassee, Acting Secretary.*

PERSONNEL OF EMPLOYEES IN GENERAL CHARGE OF THE WORK OF THE DEPARTMENT

Engineering Division

| | |
|------------------------------------|-------------------------------|
| J. L. Cresap, Tallahassee..... | State Highway Engineer |
| L. K. Cannon, Tallahassee..... | Ass't. State Highway Engineer |
| G. L. Derrick, Tallahassee..... | Bridge Engineer |
| C. W. DeGinther, Tallahassee..... | Ass't. Bridge Engineer |
| Harvey A. Hall, Gainesville..... | Testing Engineer |
| F. W. Berry, Jr., Tallahassee..... | Office Engineer |
| John R. Stewart, Gainesville..... | Supt. of Equipment |
| R. L. Bannerman, Marianna..... | Div. Engr.—1st Div. |
| J. H. Dowling, Lake City..... | Div. Engr.—2nd Div. |
| R. J. Cassie, Fort Pierce..... | Div. Engr.—3rd Div. |
| L. B. Thrasher, Ocala..... | Div. Engr.—4th Div. |
| A. W. Kinney, Lakeland..... | Div. Engr.—5th Div. |
| R. C. Fergus, Fort Lauderdale..... | Div. Engr.—6th Div. |
| Henry Wilson, Punta Gorda..... | Div. Engr.—7th Div. |

Accounting Division

| | |
|---------------------------------|------------|
| S. L. Walters, Tallahassee..... | Accountant |
|---------------------------------|------------|

B. A. Meginniss, Attorney for the Department,
Editor and Business Manager

Chapter 8553 of the Laws of Florida of 1921, and the Department being willing to accept said aid under the conditions specified in said Chapter;

"Now, Therefore, be it agreed as follows:

"1. The Commissioners agree to turn over, transfer and deliver to said Department from its duly authorized Road Bonds heretofore voted in the sum of \$750,000.00, the aforesaid bonds amounting to \$241,000.00, said bonds being of the denomination of \$1,000.00 each, numbered from 408 to 648 inclusive, dated July 1st, 1922, payable to bearer July 1st, 1952, bearing interest at the rate of five (5) per cent per annum, payable semi-annually on January 1st and July 1st, principal and interest being payable at the National City Bank of New York City, or at any bank in Madison, Florida, the said proceeds of the sale of said bonds to be used by the Department only in the construction of the road as hereinbefore specified, providing that not exceeding \$7,000.00 per mile of said bonds shall be spent in constructing said highway which has been duly designated by the Department as a part of the system of State Highways or State Aid Roads.

"2. The Department agrees that if and when said bonds amounting to \$241,000.00 have been transferred, turned over and delivered to said Department as aforesaid, it will construct said road and bridges incidental thereto, in a good substantial workmanlike manner, providing an eight-inch compact base at least sixteen (16) feet wide, surface-treated if necessary, or a standard form of finished pavement according to the specifications of the State Road Department. The actual cost of construction of said road to be not less than the par value of said bonds, with interest thereon from the date of delivery thereof to the Department.

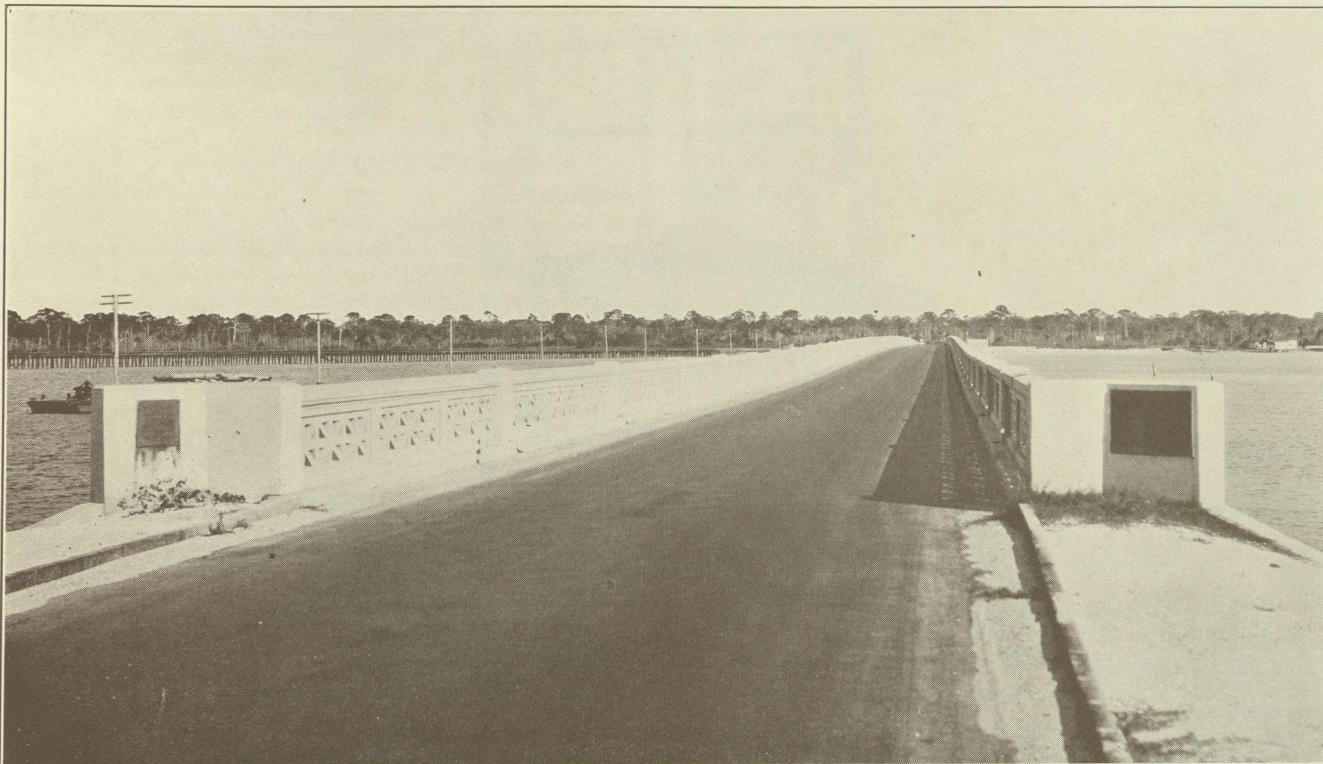
"3. The Department agrees to expend and use and employ as much or more than the par value of said bonds in the construction of said road in said County of Madison, in accordance with said specifications.

"4. The Department agrees that upon the delivery to it of said bonds amounting to \$241,000.00, that an amount of State or Federal Aid at least equal to the face or par value of said bonds will be appropriated and allowed on the construction of said highway in said County sufficient with the proceeds of said bonds of \$241,000.00 to insure the construction of said highway, and agrees that said sum and the proceeds of said bonds shall be expended in constructing and hard surfacing the same.

"5. It is mutually agreed that if the actual cost of constructing said road in said County shall be less than \$241,000.00, the Department will expend the balance of said sum in hard surfacing other State or State Aid Roads in said County as shall be agreed upon by and between the Department and said Commissioners.

"6. It is further agreed that the Department from the proceeds of the sale of said bonds to be turned over to it will pay all incidental expenses necessarily incurred in making sale thereof and procuring the opinion of a Bond Attorney as to the validity of said bonds, but the Department shall not be required to pay any part of the expense of printing or engraving said bonds.

"In Witness Whereof the Department has caused this instrument and one other instrument of like tenor and date to be executed in its name and behalf by its Chairman, and the Commissioners of Madison



Seminole Bridge near St. Petersburg. Looking East.

County, Florida, have executed this instrument and one other instrument of like tenor and date this 1st day of July, A. D. 1926.

STATE ROAD DEPARTMENT OF FLORIDA,
By F. A. HATHAWAY,
Chairman.

BOARD OF COMMISSIONERS OF
MADISON COUNTY, FLORIDA.
By L. A. FRALEIGH,
Chairman.

R. C. REAVES,
J. P. TAYLOR,
E. B. WILLIAMS,
J. J. SALE."

And—

Whereas, The State Road Department has practically completed the work and carried out the provisions specified in said agreement to be performed by the said Department, and will shortly fully complete the same; now, therefore,

Be It Resolved by the State Road Department of the State of Florida, that the execution of the said agreement hereinabove recited, by the Chairman, be and the same is hereby ratified and confirmed, and that this Department does hereby obligate itself to carry to completion the several agreements on its part stipulated to be performed.

Project 614, Road 5, Sarasota County

On motion of Capt. Hillman, seconded by Mr. Schilling, the following resolution was unanimously adopted:

Resolved, That the bid of West Construction Company, Chattanooga, Tennessee, submitted March 22nd, 1927, for the construction of an asphaltic concrete pavement on Road 5, in Sarasota County, between Sarasota and Venice, known as Project 614, in the sum of \$439,623.96, be and the same is hereby ac-

cepted and the contract therefor be and the same is hereby awarded to the said firm.

Project 543, Road 3, Seminole County

On motion of Mr. Green, seconded by Mr. Schilling, the following resolution was unanimously adopted:

Resolved, That the bid of M. C. Winterburn, Inc., Jacksonville, Florida, submitted March 22nd, 1927, for the construction of a bituminous macadam pavement on Road 3 in Seminole County between Sanford and the Orange County line, known as Project 543, in the sum of \$368,452.50, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.

Project 668, Road 4, Brevard County

On motion of Mr. Bayliss, seconded by Mr. Green, the following resolution was unanimously adopted:

Resolved, That the bid of C. A. Steed & Son, Okeechobee, Florida, submitted March 22nd, 1927, for the construction of a surface-treated lime rock base on Road 4 between Sharpes and Bonaventure, in Brevard County, and known as Project 668, in the sum of \$248,763.93, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.

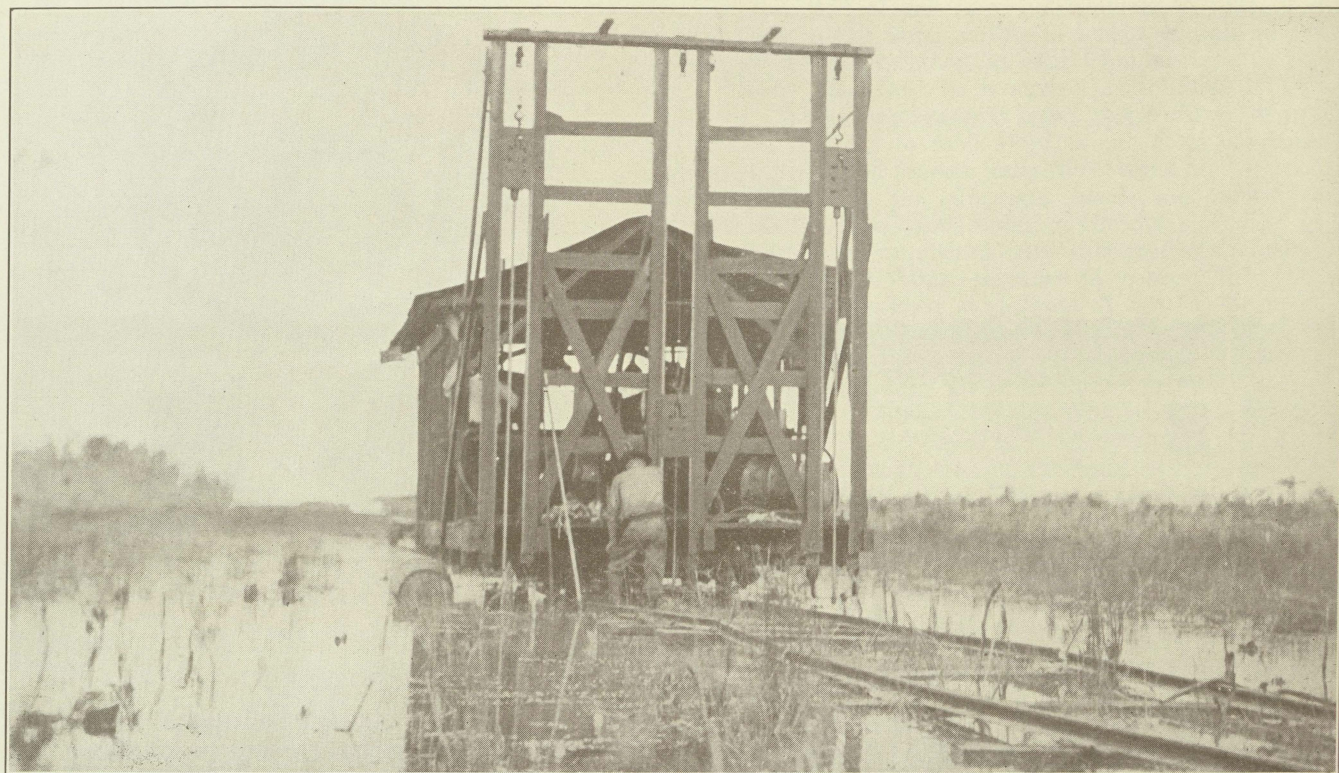
Project 648, Road 2, Hardee County

On motion of Mr. Green, seconded by Mr. Bayliss, the following resolution was unanimously adopted:

Resolved, That the bid of Wm. P. McDonald Construction Company, Lakeland, Florida, submitted March 22nd, 1927, for the construction of a surface-treated lime rock base on Road 2, between Buchanan and Brownsville, in Hardee County, known as Project 648, in the sum of \$112,549.85, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.

Project 564-C, Road 5, Charlotte County

On motion of Mr. Green, seconded by Mr. Schilling, the following resolution was unanimously adopted:



Project 669-V. Collier County Road 27 (Tamiami Trail). Drill Outfit in Action.

Resolved, That the bid of Stidman & Hughes, Lakeland, Florida, submitted March 22nd, 1927, for the construction of a surface-treated lime rock base on Road 5, in Charlotte County, between Punta Gorda and Acline, known as Project 564-C, in the sum of \$73,794.17, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.

Project 676-C, Road 19, Levy County

On motion of Mr. Schilling, seconded by Mr. Bayliss, the following resolution was unanimously adopted:

Resolved, That the bid of H. L. Clark & Sons, Miami, Florida, submitted March 22nd, 1927, for the construction of a surface-treated lime rock base on Road 19, in Levy County, between Bronson and the Marion County line, known as Project 676-C, in the sum of \$206,463.84, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.

Project 687-A, Road 2, Lake County

On motion of Mr. Green, seconded by Mr. Schilling, the following resolution was unanimously adopted:

Resolved, That the bid of Manley Construction Company and C. R. Scott, Leesburg, Florida, submitted March 22nd, 1927, for the construction of a sheet asphalt pavement on Road 2 in Lake County, between Helena Run and Groveland, known as Project 687-A, in the sum of \$396,855.24, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.

Project 659, Road 3, Clay County

On motion of Mr. Green, seconded by Mr. Schilling, the following resolution was unanimously adopted:

Resolved, That the bid of Duval Engineering and Contracting Company, Jacksonville, Florida, submitted March 22nd, 1927, for the construction of a surface-treated lime rock base on Road 3, between

Green Cove Springs and Black Creek, known as Project 659, in the sum of \$44,828.16, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm

Project 713, Road 28, Columbia County

On motion of Mr. Bayliss, seconded by Mr. Schilling, the following resolution was unanimously adopted:

Resolved, That the bid of C. A. Henderson, Jacksonville, Florida, submitted March 22nd, 1927, for the clearing, grubbing and grading and necessary drainage structures on Road 28, in Columbia County, between Lake City and the Union County line, known as Project 713, in the sum of \$77,531.56, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to said contractor.

Project 573-D, Road 2, Orange County

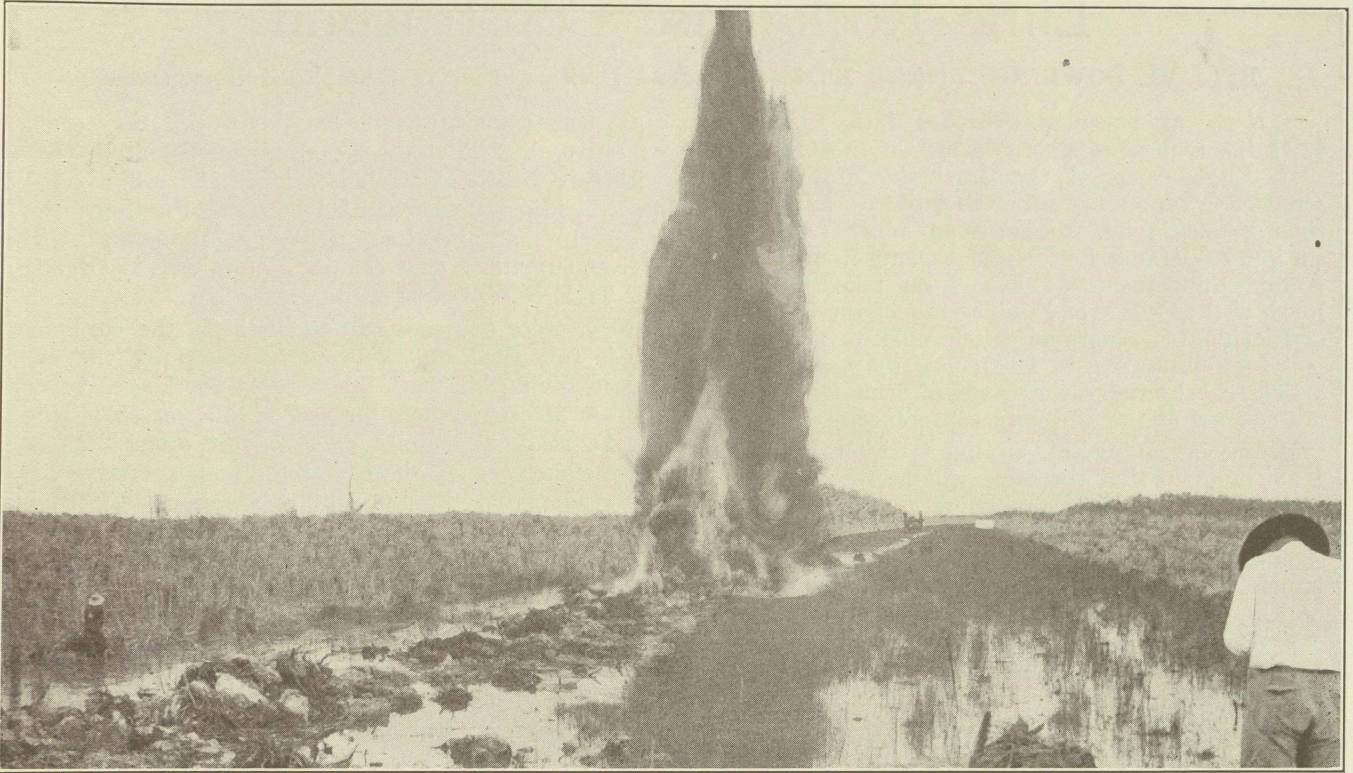
On motion of Mr. Bayliss, seconded by Mr. Green, the following resolution was unanimously adopted:

Resolved, That the bid of F. X. Bradley, St. Augustine, Florida, submitted March 22nd, 1927, for the clearing, grubbing and grading and necessary drainage structures on Road 2, in Orange County, between Orlando and Plymouth, known as Project 573-D, in the sum of \$86,947.50, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to said contractor.

Projects 663 and 679, Hernando and Citrus Counties

On motion of Mr. Green, seconded by Mr. Bayliss, the following resolution was unanimously adopted:

Resolved, That the bid of Kibbey Engineering Company, Birmingham, Alabama, submitted March 22nd, 1927, for the construction of guard rail on Projects 663 and 679, in Hernando and Citrus Counties, in the sum of \$17,404.80, be and the same is hereby accepted and the contract therefor be and the same is hereby awarded to the said firm.



Project 669-V—Collier County—Road 27 (Tamiami Trail). Blasting in the Everglades.

Project 676-C, Road 19, Levy County, and Project 687-A, Road 2, Lake County

An intimation was received from J. C. Johnston Construction Company, Tampa, Florida, low bidders on the above projects that they considered their bids too low, and suggested that the Department disregard the said bids.

Award of Contracts Approved

On motion of Mr. Schilling, seconded by Mr. Bayliss, the following resolution was unanimously adopted:

Whereas, Bids were asked by the Department for the construction of the projects hereinafter designated, and

Whereas, The firm and individuals respectively named were successful bidders thereon; now, therefore,

Be It Resolved, That the action of the Chairman in awarding and executing the contracts hereinafter named be, and the same is hereby, approved and confirmed, which said contracts are as follows, to-wit:

Project 41-B, Road 4, Dade County, concrete bridge, contract awarded to James Betteridge, Miami, Florida, \$38,534.40;

Project 698, Road 19, Leon County, concrete bridge, contract awarded to Peterson & Earnhart, \$34,773.06;

Project 699, Road 19, Jefferson County, concrete bridge, contract awarded to Peterson & Earnhart, \$24,946.52.

DUVAL COUNTY—Road No. 1

Fred M. Valz, T. C. Imeson, C. J. Acosta and the entire membership of the City Commission of Jacksonville, W. L. Stanley, vice president of the Seaboard Air Line Railway Company, the manager of the Jacksonville Terminal Company and a vice president of Southern Railway, appeared before

the Department and requested its participation in the construction of a viaduct over the tracks of the carriers on State Road No. 1 on Enterprise street in the City of Jacksonville. After explaining the matter in detail, the delegates were informed by the Chairman that the Department will take the matter under consideration.

ROADS FOR THE MASSES

According to reports, Germany plans a six-year program of road building, to comprise about 9,000 miles of auto roads to attract tourists. At \$40,000 a mile, this would cost \$360,000,000, a good investment if Germany's laws were made to invite outsiders.

The United States spends about twice as much every year for highways as Germany plans to spend in six years.

The United States is building hundreds of thousands of miles of highways to connect every city, town and hamlet.

Almost every person in this nation can be reached by telephone, and, if necessary, we could move practically every person by automobile at the same time. —Louisiana Highway Magazine.

SHADED HIGHWAYS

The state highway department of Connecticut is busy with plans for extensive planting of shade trees along its highways in the spring. This will be the second annual planting in the department's program of highway beautification. Specifications call for the setting out of trees along seven state roads. They include pin oaks, sugar maples, Norway maples, European lindens and silver maples, all beautiful shade trees.—Ex.

Lime Rock Base Construction

By J. H. DOWLING, Division Engineer, Second Division, Florida State Road Department

ON the afternoon of February 15th, 1927, upon the request of Prof. Barnes, of the College of Engineering, of the University of Florida, I attended a conference for road builders, and at that time I was invited to make an address upon the subject of "Lime Rock Base Construction," which I did. Subsequently I have been asked by Prof. Reed, of the College of Engineering, of the University of Florida, to prepare an article upon this same subject for publication, so I will use as a basis for this article substantially the same information used in my address at the aforesaid conference.

Before beginning this article, I wish to state that I am mindful that the same will be read and diagnosed by many who may know a great deal more about this subject than I do, but in the event I should succeed in placing before readers anything to impress you, just please accredit it to an accident on my part, rather than to design.

My entire experience has been with soft Florida Lime Rock, having had no experience with Coquina or Ojus Rock.

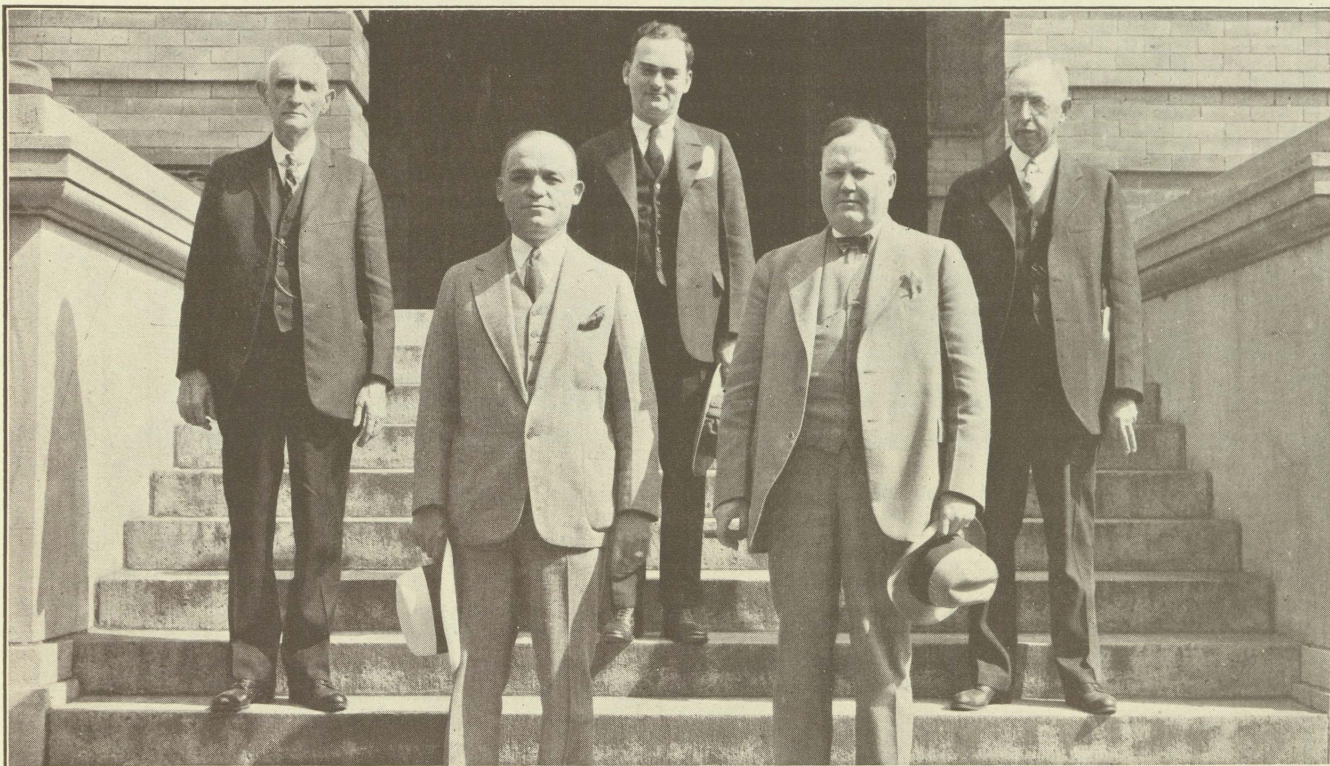
On my division there has been constructed during the past year—33 miles of Florida lime rock base road, 20 feet wide, this being Federal aid, and 51.4 miles of Florida lime rock base, 19 feet wide, this being State projects. The 33 miles referred to, as well as the 51.4 miles mentioned, were awarded to various contractors, whose bids on this work ranged from \$1.20 to \$1.57 per square yard, these amounts depending upon two considerations—one of freight rates and the other the cost of haul from the unloading points.

As to lime rock base construction, I shall dwell, briefly, upon the subject of the material itself. The lime rock shall contain by weight not less than ninety-seven percent of calcium and magnesium and the remaining three percent must be PRACTICALLY FREE FROM ORGANIC MATTER, and it shall be uniform in quality and free from clay and flint. We do not make an inspection of this material at the plant but make all of our inspection upon the arrival of the cars at the unloading point. This inspection is a visual one. We look for the gradation of the material and also for the amount of flint and clay that the car may contain. It does not require a man who has had considerable experience in lime rock base construction long to tell whether or not the car will pass. Approximately one sample out of every six cars is sent to Mr. Harvey A. Hall, our Testing Engineer, for analysis, Mr. Hall's address being Gainesville, Florida.

Secondly, I wish to dwell upon the matter of the equipment contractors are required to have. There is a clause in the Florida State Road Department's specifications to the effect that where the contractor has only one three-wheel ten-ton roller he is limited to put down only 600 square yards a day, or 300 lineal feet of 20 foot base, which forces the contractor to have two or more three-wheel ten-ton rollers, as experience has clearly demonstrated that where the contractor has only one three-wheel ten-ton roller he cannot properly roll and shape any more than the amount aforesaid. In addition contractors are required to have one 2½-ton road machine, and

right here I wish to state that this weight may seem excessive, but it has been also demonstrated that with this weight of machine a truer and much more smooth-riding surface can be obtained. Furthermore, contractors are required to have a pump that will deliver 60 gallons of water per minute, MEASURED AT THE NOZZLE.

Now, as to our construction methods, the contractor is furnished stakes, properly placed by the engineer, giving him both line and grade. These stakes are set fifteen feet off the center line, on each side of the road, a distance of fifty feet apart. After these stakes are set the contractor then prepares his sub-grade from the line and grade given by such stakes. Most contractors prefer to use wooden forms of 2' x 11' dimensions, which forms must be substantially held in place and set true to line and grade, such line and grade being taken only from the engineer's stakes. Before a contractor is allowed to dump any rock the sub-grade must be prepared to the required cross section, and be thoroughly rolled and watered, after which the contractor is allowed to dump the first two loads on the sub-grade, which two loads are immediately leveled up and an apron-like spread is arranged in the direction in which the rock dumping is to continue, and thus, in this manner, the rock is kept clean, being dumped on the rock all the time, preventing dirt from the sub-grade mixing in with the rock, contractors being at all times required to haul over the rock as it is dumped, and at no time is contractor allowed to haul rock over the sub-grade. Contractors are required to level up the spread of the rock as it is dumped, which is to his advantage, because in shaping up, with the more uniform spread, the easier it is for him to obtain the desired finished cross-section. It is also required by the State Road Department that care shall be taken so as to prevent the possibility of having an excessive amount of coarse rock alongside the forms, because under the action of the roller it has a tendency to produce low edges. On all of our main highways we ask the contractor for bids on 8' compacted lime rock base. We do not, however, tell the contractor how thick he must spread the rock to give the 8' compacted rock base, but we have found from experience that an 11' loose spread, when properly rolled, scarified and shaped up gives us the required eight inches. One ton of lime rock will give 2½ square yards of 8' compacted rock base. As mentioned above, contractors are required to furnish a pump that will deliver water at the rate of 60 gallons per minute, measured at the nozzle, at the point of delivery, which is at the spread of the rock. All water must be free from silt—that is the water must be clean. As the rock is dumped from the truck the water in the amount and manner above mentioned must be poured onto the rock to accomplish the proper and required saturation. Great care in the pouring on of the water is necessary, in order to avoid super-saturation, because at times the crushed stone becomes churned up with the dirt in the sub-grade, necessitating our requiring the contractor to take this material out, without additional compensation, because of his mistake, then contractor is required



Members of the State Road Department: left to right, W. J. Hillman, Live Oak; I. E. Schilling, Miami; J. Harvey Bayliss, Pensacola; Fons A. Hathaway, chairman, Jacksonville; E. P. Green, Bradenton.

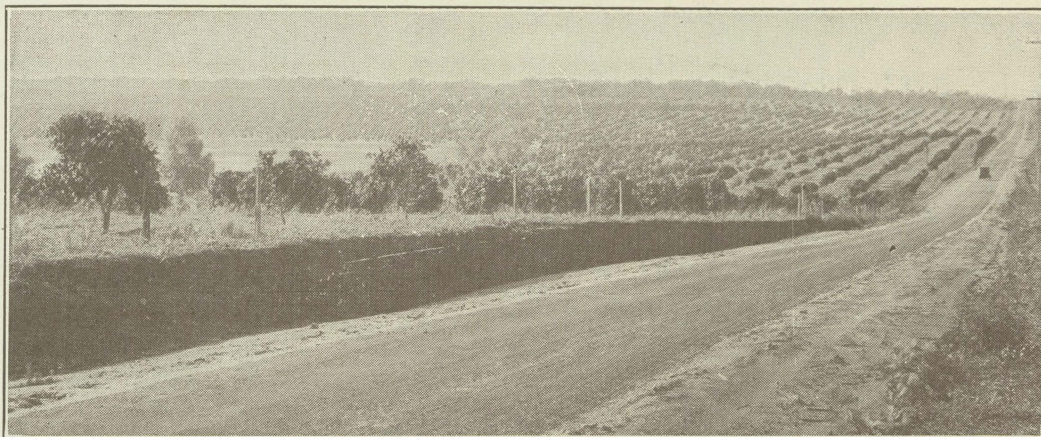
to replace this with clean crushed stone which shall be rolled and watered, as I have already mentioned.

After the dumping, spreading and watering of the rock, this operation must be followed closely by rolling with a three-wheel roller, weighing not less than 10 tons, with a rear wheel compression of not less than 350 pounds per lineal inch of tire width of the roller, AND THE ROLLER MUST BE KEPT CONTINUALLY ROLLING UNTIL THE CRUSHED STONE IS COMPACTED INTO A DENSE AND UNYIELDING MASS. Now, as to scarification and shaping of the rock to the required cross-sections, it has been found to be a good practice to scarify that portion of the base laid today not later than the following day, said scarifying to be a depth of 4 inches and shaped with a road machine weighing not less than $2\frac{1}{2}$ tons. The reason for scarifying it the next day is because there remains sufficient moisture in the crushed stone to keep it in a more workable condition and when shaped up and rolled gives a more dense and unyielding base than it would be possible to get were we to wait three or four days giving the base time to dry out, in turn necessitating the adding of water in irregular proportions, causing weak places, due to this super-saturation.

In order to check the thickness of the rock base we use an inch and a half augur and a $\frac{1}{4}$ " steel rod two feet in length, flattened out on one end in the shape of a spoon and at the other end the same is bent in the shape of a right angle. The spoon end is used in cleaning out the hole made by the augur and the right angle end of the bar is used to fasten underneath the base of the pavement, in the hole, then with the use of a graduated rule, set on top of the right angle, which is fastened under the base,

in the hole, we are able to tell the thickness of the base at that particular point. Three or more such borings are taken every one hundred feet. As I have previously brought out, all of our contracts have been let for 8" compacted lime rock base, but it is a fact that it is hardly possible to obtain throughout the entire project an 8" compacted rock base, but if the base measures up to our required cross-sections and there is found to be only a few places running as low as $7\frac{3}{4}$ and $7\frac{1}{2}$, I would pass these, provided all the boring averaged up to the required 8".

Checking the finished base, after it has been properly rolled, scarified and shaped to the required cross-sections, is done by the use of a wooden-template, the length of this template being the width of the road base, either 19 or 20 feet, this template being constructed of timber, the dimensions of which are $1\frac{1}{2}$ " x 8", one side of which is cut true for a straight-edge, the other side being cut in a straight line from the outside bottom to the center within 5 inches of the top, so that this template can be used in the order described for checking the crown with one side of the template and the straight end with the other side thereof, the finished surface not to show a variation of more than $\frac{1}{4}$ -inch in ten feet. In connection with the use of the template, we also carry along a spirit level which we set on the top of the template while checking the crown, to ascertain whether or not the edges of the pavement on both sides are up. This enables us to avoid having low edges. After the base is completed it is then thrown open to traffic for a period of thirty days before any surface materials are placed upon it, as in this manner we can determine the weak places, if any develop.



State Road No. 23 at Greer Hill. Constructed by Pasco County.

Pasco County's Programme

(EDITOR'S NOTE.—The data for the accompanying article was furnished by C. H. Carroll, Zephyrhills.)

PASCO COUNTY has completed its program of road building under a bond issue of \$1,330,000, building the entire 154.5 miles provided for in the bond issue and, in addition doing considerable other road work not therein provided for. And the county had a balance on hand of \$36,338.38 in this fund after the completion of all these roads. This showing was regarded so remarkable that it attracted general attention, and Engineer F. D. Cosner and Chief Road Inspector, C. H. Carroll, were complimented for the good showing made.

The program as first outlined covered 25 projects, and later another was added: The rebuilding of two miles on the Pasco west coast road, part of which was financed from the bond money. Every road was built right up to the engineer's specifications, and in a number of instances where traffic demands made it wise to do so, the construction was heavier than first called for. All the roads were built according to the standard specifications of the State

Highway Department, but the compacted base was lighter than the state roads.

Practically all grading was done with machines.

The type of surfacing is the inverted bituminous surface treatment, known as Finley method type B. After completing all the roads in the program and in addition thereto—approximately \$35,000 was spent on extra work not included in the original estimate, which added to the general balance equals the sum of \$71,338.00.

The principal contractors on this work were the McLeod Construction Company of Tampa, for the grading and rock base, and the P. F. Connelly Paving Company for the surface treatment. The work was done under the direction of the consulting Engineer, F. D. Cosner, Dade City, C. H. Carroll being general inspector.

The following are the County Commissioners under whom the program was constructed:

B. A. Thomas, Chairman of the Board.
D. H. Clark,
D. H. McCarthy,
C. E. Dowling,
F. Boyette.

Some Requirements of the Highways of the Future

(From the Manufacturer's Record)

"SUPER-AUTOMOBILE highways built through private enterprise are inevitable," says Walter Parker, of Fenner & Beane, New Orleans financial house, and formerly manager of the Association of Commerce, New Orleans. "Highway construction is imposing a monster burden on the taxpayers for a system which, long before its completion, is known to provide inadequate facilities. Automobile owners do not object to the cost of good machinery, good roads and good service. That fact has made possible the rapid development of the automobile industry and the speed shown in highway construction. But the new generation will require far more in highway building than is provided for in present programs or capable of being paid for out of present-day tax revenues. The American people now pay in

Federal, State and local taxes some \$11,500,000,000 annually. They are demanding reductions, not increases, in taxes."

Mr. Parker predicts that "automobile owners will soon be demanding wide, protected concrete speedways connecting the great centers. They will desire grade crossings wholly eliminated. Even if super-highways of this character are to cost no more than \$50,000 a mile, the addition of such a cost to the cost of normal highway construction and the carrying out of existing highways plans would bankrupt the tax collector and the public treasury.

"But super-highways of this character would be a good investment from the viewpoint of the automobile owner. They would save him time and real money on tires, wear and tear and on repair bills.

Such roads would double the tire mileage and the life of the car. No automobile owner would hesitate to pay, say, one cent a mile for the privilege of using such a highway in preference to using free publicly built highways of less comfort and convenience. The contrast would equal that of a Pullman car and a day coach."

That the time has arrived when private enterprise may well begin to think of the investment opportunity presented by the need for super-highways is the belief of Mr. Parker. Assuming that such a highway could be built for \$50,000 a mile, 100 miles would involve the expenditure of \$5,000,000, he states, and a toll of one cent a mile would produce an annual revenue of \$1,825,000 with 2,500 vehicles using such a road each way each day.

It is suggested that in this manner business enterprise might well enter the field of highway building so as to relieve congestion through offering to motor-vehicle owners a better and more economical service than the free public highways offer.

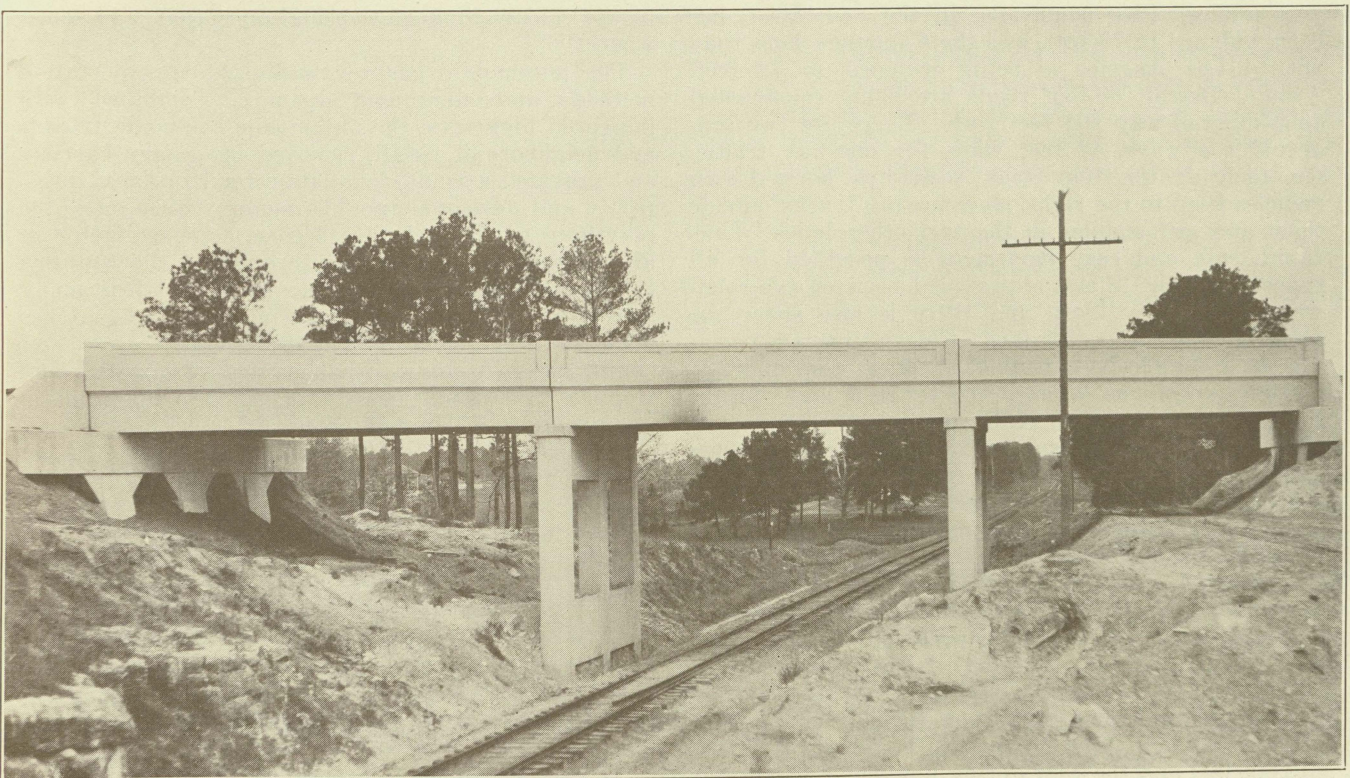
The production in the future of a very low-cost type of motorcar and the liquefaction of coal and lignite in the form of a low-cost motor fuel are foreseen by Mr. Parker, and these developments will, he thinks, hasten the need for the construction of super-highways of a de luxe character.

While the idea of building super-highways by private enterprise is not altogether new, the New York Times points out in a recent editorial that it has not been much discussed in recent years owing to the prevalent hope that the federal and local governments would be able to improve existing roads and build new ones to meet the nation's needs. "But that the use of the roads is and will continue to be far in excess of the rate of building and repair now seems established," says the Times. "Aside from the constant increase in private cars and trucks, the bus

system promises to grow so fast as to add to the congestion and to increase the wear and tear. Each new invention which cheapens the cost of motoring will increase the strain on the nation's roads. To meet this will require ever-growing sums of money, which will have to come out of the taxpayers in some form or other."

Already the building of special motor-vehicle roads, generally toll roads, has received particular attention in Italy. The Engineering News-Record states that in Italian practice the *autostrada*, or special motor-vehicle road, is a paved highway on a separate right-of-way fenced and guarded at entrances, without intersections and crossings at grade, designed and reserved for motor vehicle—truck or automobile—traffic solely. It is described as an independent road, separate and distinct from existing highways between the same termini, designed and built for uninterrupted speed.

"Voluminous conclusions broadly in favor of such roads were adopted recently at the International Road Congress at Milan, with, however, the delegates from Great Britain and the United States declining to vote on the basis that the experience and service records are lacking for 'definite conclusions capable of general application,' " says the Engineering News-Record. "The conclusions are most interesting, perhaps, for the indication they furnish of the liberal views which European highway authorities express regarding the financing of special roads. It is held that they may be financed from the State's general balance, by a general motor tax, by general taxes (tolls) on users, by local bonds or subsidies or by any combination of these which may be for the public weal. Tariffs for tolls, it is considered, should be regulated by public authority. In regard to the justice and expediency of the toll-road principle the conclusion is that 'it is quite fair and rational that



Project 633—Road 1. Overhead Crossing near Chattahoochee.

a special tax should be levied upon those who willingly make use of a speedier and more convenient means of transport over certain distances, while they are still free as any other motorist to choose between the autostrada and the ordinary road.' As the problem of the high-speed trunk road, perhaps the toll road, is directly before us in America, these conclusions of European engineers are of particular interest."

The increasing congestion on the highways of the country will force many innovations in highway engineering, is the belief of W. C. Markham, executive secretary of the American Association of State Highway Officials. Among these innovations will be cross-overs and cross-unders at intersecting points on all important highways and boulevards. Wide roadways, well lighted at night by electricity, or possibly by some method yet to be applied, such as a radioactive substance, will, if present trends continue, be policed through their lengths by "stop" and "go" lights. Indications are that on main highways instead of speed limits of 35 miles an hour motorists will be required to maintain some minimum figure, say 25 miles per hour, and failing to do this, may be arrested for obstructing traffic. There is a possibility of pedestrians who risk their lives and peace of mind of drivers by crossing opposing traffic being arrested for interfering with the movement of traffic. In congested areas Mr. Markham believes that separate traffic lanes will be provided for pedestrians and vehicles.

These predictions are even now being fulfilled in part. In Pennsylvania and Indiana the Lincoln Highway is being widened to 36 feet. Four lane pavements with each 20-foot strip kept within its bounds, preventing cutting-in either from opposing or accompanying traffic, are already being built in Illinois and Wisconsin. In Chicago an underground escalator will carry the pedestrian across the street, where now he is forced to pass through 14 lines of automobiles. Pico boulevard, in the Southwest, has been widened to 75 feet, and the Cahuenga Pass road out to Los Angeles is being widened to 72 feet. Around Detroit 88-foot roads are being constructed on a right-of-way 204 feet wide. There are two separated roadways, 44 feet wide, for one-way traffic. On each of the four-track roadways horse-drawn vehicles keep to the right, slow-moving trucks outside them and automobiles in the two other lanes. Thus rapid, safe and easy movement is provided for all types of traffic. Space is provided between the roadways for trolley lines, and there is also space for parking and for pedestrians. Chicago has just completed a double-deck boulevard at a cost of \$22,000,000, known as Wacker Drive. It is eight blocks long and is expected to reduce present traffic congestion in the "loop district" 43 per cent. Automobile traffic on the upper level is wholly separated from the trucking on the lower level. Even before its completion new values in surrounding property of between \$200,000,000 to \$300,000,000 had been created. An elevated "express highway" is the answer the Borough of Manhattan and the State of New Jersey are making to the big traffic problem that will come next spring with the opening of the Holland Vehicular Tunnel, and traffic engineers say it is a forerunner of wholesome revolution in city motor highways as a whole. The Manhattan boulevard will cost \$13,000,000 and the New Jersey highway \$40,000,000.

To make highways safe and to speed up traffic it

is predicted that separate roads will be built for freight and for passenger service—a heavy-type construction for the first and a lighter type for the second. To promote safety at the intersection of important roads highway grade separations are now being built in the West, the design providing for two levels—through traffic proceeds on an overhead bridge and turning traffic swings wide of the bridge down to the level of the highway crossing at right angles beneath.

Thus throughout the country a digest of expert opinion shows the overwhelming conviction is upon traffic officials that automobile production will continue at high levels and the only way out is to find room for more cars and to handle traffic more efficiently.

Power Creates Wealth

IT would be difficult, if not practically impossible, to exaggerate what improved highways mean in the life of the nation and in material prosperity not only to the state, parish, city, town, community and the individual citizen.

It has been truly stated that he who lessens the cost of power and gives it a wider distribution is a benefactor of mankind. Whether consciously or unconsciously, he is hastening the day for more widespread prosperity and for the uplifting of millions of people who, without the use of power, would have continued through the ages to be denied the blessings which are so common to all of us.

Good roads throughout Louisiana provided for a wider distribution of power. Without improved highways it would not have been possible to intelligently and economically use the increased power. Therefore, it does not require elaborate argument to convince the ordinary taxpayer that present-day methods of transportation and communication are due directly to the construction of thoroughfares that "go somewhere."

The automobile has revolutionized transportation methods and eliminated distance. Combined with improved highways, the automobile has made friends and neighbors of us all, removed imaginary barriers and provided a sound foundation for happiness, prosperity and development. The motor vehicle, once the plaything of the rich, has become a prime factor in all the ramifications of life throughout the country. It has literally changed the face of the earth in many respects; it has changed all business methods. It has made suburban development on a large scale a possibility, and in doing so has created vast wealth and stopped the trend toward congestion of population and business in limited areas. It is helping to decentralize business to the good of the country. It has given longer life and greater health to millions of people.

Back of all material advancement; back of all progress in education and in science, in the maintenance of religious activities, made possible by prosperity, is POWER. The cheaper and more easily available the power, the greater is the advancement of the people and the country. The more abundant the power for all business and pleasure activities of the state and nation, the greater will be the material advancement.

As is well known to those who give thought to such matters, before the development of Louisiana's



Celebrating opening of short Ocean to Gulf highway (State Roads 8 and 18) with ceremonies at Okeechobee, March 24. Motorcade from Bradenton and Arcadia met motorcade from Fort Pierce at Okeechobee, and Dr. Fons A. Hathaway, Chairman of State Road Department, cut rope signaling opening of highway. Left to right: "Miss Fort Pierce" (Mary Fee); Louis Eigler of Arcadia; Dr. Hathaway; E. P. Green of Bradenton, member of State Road Department and "Miss Bradenton" (Marion Curry Green). Dr. Hathaway presided at the meeting in the absence of Judge W. D. Bell of Arcadia.

splendid road system and the advent of the motor vehicle in such amazing numbers, we were sinking lower and lower in highway activities. Mud holes, impassable in winter and early spring, and sand beds in some sections, were uniting to lessen the material, religious and educational progress of the country. In vain were country churches and country schools established where impassable roads made attendance almost impossible. Thousands and thousands of children were growing up in sparsely settled sections, denied the advantages of standardized educational methods. The outlook was not encouraging.

But a tremendous change has been wrought. Men and women of vision, sensing the needs of the people and the great good that would come through improved highways, developed ideas and dreams into realities, with the result that today Louisiana has some of the finest graveled roads in the nation, affording easy access to practically every section of the state without encountering impassable mud holes. These splendid highways carry thousands of ambitious children from the remote sections to the centralized and standardized schools which have been established in the parishes, and churches and commercial centers are brought in easy reach of all.

This is the direct result of utilizing POWER. But we must not think of stopping. There is more power to be developed. We have made remarkable progress in every department of human activity and effort, but we cannot halt nor fold our hands and wait. Our splendid highways must be made more permanent—

built to stand up under any amount of traffic. The motor traffic of today, large as it undoubtedly is, is small as compared with the traffic of the next few years by automobiles, motorbuses and motortrucks.

This nation is growing with such amazing rapidity, increasing its population at the rate of 2,000,000 annually, developing its industrial and business affairs of all kinds far more rapidly than its population is increasing, that we must plan great things for the future.

It is well, therefore, that the leaders in this great industry, men of engineering skill and known business ability, men who are profoundly interested in solving the problems of transportation, men who are catching a glimpse of what road building in the future must be, should give serious thought and expression to every phase of road building. The attrition of mind against mind will bring new ideas to the front, new plans will be developed, new methods of highway construction will be studied and adopted when found to be sound in principle and application.

The highway builder, whether he be commissioner, engineer, the contractor or the day laborer on the job, is to the full extent of his work and influence rendering a great service to humanity, and giving to the people of all sections an opportunity to reap the full benefit of the increased POWER made available through the building of more and better highways and the perfection of motor vehicles.—Louisiana Highway Magazine.

Florida Has Tremendous Road Program Under Way

New Contracts Bring Work Under Way Over Twenty Million

ARKANSAS has made such splendid progress during the past several years, and has so many larger plans for the immediate future in road-building that we are sometimes led to overlook the rapid strides along the same lines which other Southern States are making or have in contemplation.

An example of this is to be found in the State of Florida, where the widely advertised collapse of the "boom" has led many people to think development of every kind had come to a standstill there. Quite to the contrary, Florida right now is pressing forward the largest program of highway construction in the entire South, more than \$20,000,000 being involved in projects now under way.

The Florida system embraces 5,654 miles, of which 2,479 miles are known as Preferential Trunk Lines, and are being permanently surfaced throughout the mileage before attention is given to less important thoroughfares. Already six main roads into and through the State, East, West, North and South have been completely surfaced, and half a dozen more will be finished during the year.

Annual revenues of the Highway Department of Florida are approximately \$15,000,000, the money coming from a one-mill ad valorem tax, a four-cent gasoline tax, and one-eighth cent oil tax, the automobile license tax, county donations and Federal aid.

The State has also recently adopted a model title registration law which, in addition to giving the Highway Department augmented revenue from automobiles, makes their theft in Florida a practical impossibility, and reduces anti-theft insurance rates approximately 20 per cent.

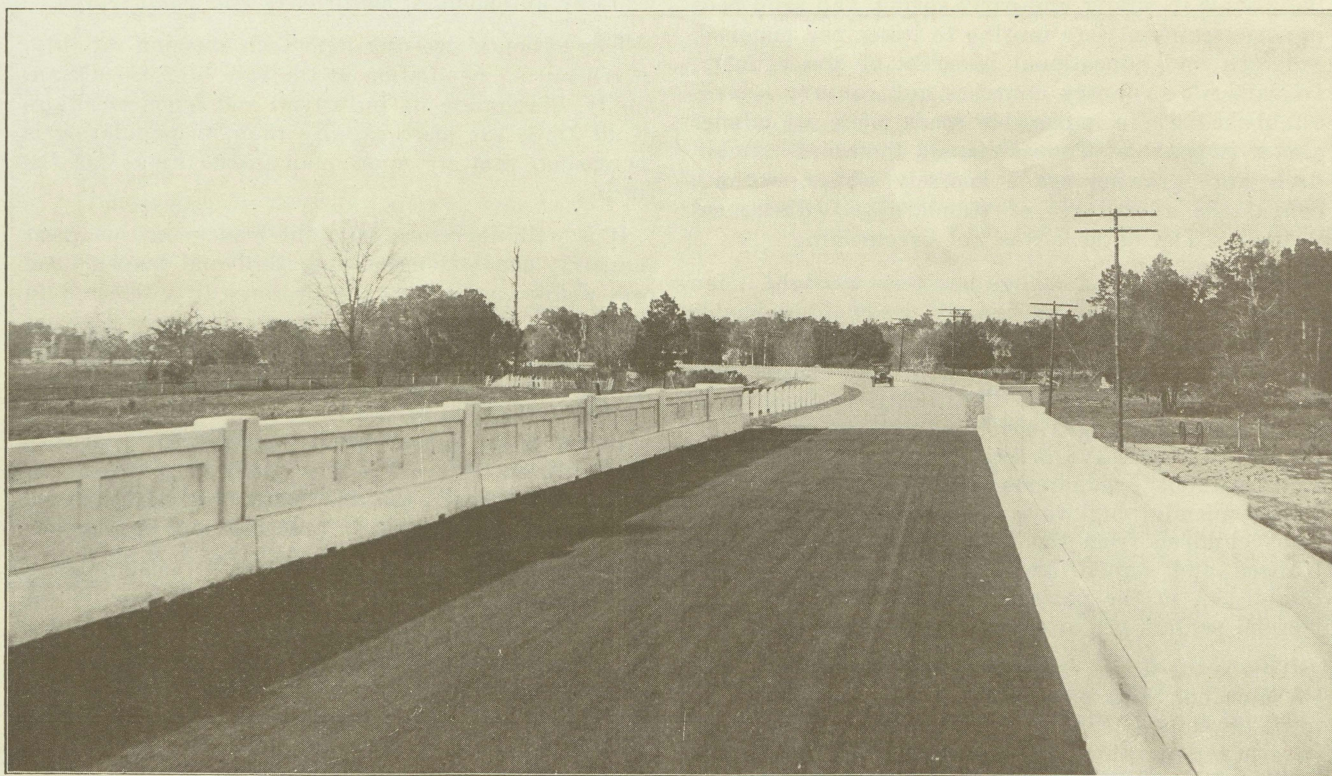
The early completion of trunk line highways in Florida has made the State more than ever attractive to tourists, and business there is reaping the harvest that comes from tourist trade during the winter months, when highways of other States are out of commission.

As an extra inducement to the motorist, speed laws are sanely and conservatively administered, on many open stretches of State highway the speed limit being raised to 45 miles.

Backing up the road program, many thousands of dollars are being spent by the State in publicity, newspaper advertising, attractive booklets and other advertising matter, which calls attention to the advantages of the climate, resources and laws to be found there.—Arkansas Highways.

NATIONAL—In the fiscal year ending June 30, 1926, 622.5 miles of forest highway projects were completed, bringing the total improved mileage to 3,045.6, equivalent to 22.6 per cent of all designated forest roads.*

AUSTRALIA—During a recent drought in Queensland, Australia, the highways of the region served the unusual purpose of carrying thousands of sheep. Huge live stock trucks with four-decked bodies were used to carry more than ten thousand sheep a distance of 220 miles to food and water. The railroads of the territory do not run between the two pasturages, and it is believed that the annual employment of motor trucks will solve a problem which has long confronted the sheep ranches of the country.



Looking from bridge over Suwannee River to beginning of Project 565, Road 1, Madison County. Concrete pavement.



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Charles IV complained at that time about the constant rain and humidity in Nuremberg and about the mud which was to be found there at all times and which was sometimes so impassable that a horseman could not get through without stumbling, falling or being splashed on his way from his inn to the Imperial castle.—New Orleans Journal of Commerce.

Motoring Here and There

THE horse, regarded as an animal capable of adapting itself to almost any circumstances or conditions as soon as it learns what it is all about, has come, evidently, to regard the automobile and all other horseless vehicles met along the streets and highways more or less philosophically. When the motor vehicles first appeared they created consternation upon the roads. Country and city horses which had first learned to look without suspicion upon the trolley car, and which later had composed themselves sufficiently to allow a traction engine to chug by without too great concern, seemed to resent the speedy automobile which darted along the highways at the unprecedented speed of fifteen miles an hour. These they have learned to look upon complacently, somewhat as they regard the farm tractor, the logical successor of the traction engine, accepting it as a valuable labor-saving device. It is interesting in this connection to observe, however, that in many of the cities and states there remain in effect those laws and ordinances requiring a flag-man or torch-bearer to precede the cumbersome and slow-moving tractor along streets and highways to warn drivers and pedestrians of the approach of these juggernauts. And this while automobiles of all sizes and speeds are filing past in all directions.

But it seems that while the automobile has won the confidence, if not the respect and esteem of its chief rival in the field of transportation, it still has some unfinished business to attend to in the realm of other animals, domesticated and undomesticated. A Boston paper a day or two ago announced the fact that the Massachusetts Legislature has been requested by the Senator from the district embracing the thriving city of Greenfield to reimburse one of his constituents for damage done to an automobile by wild deer in that vicinity. Not only actual but punitive damages are asked, upon the theory that the machine was being driven along the road in an orderly and inoffensive manner and that the attack upon it by the deer was unprovoked and unwarranted.

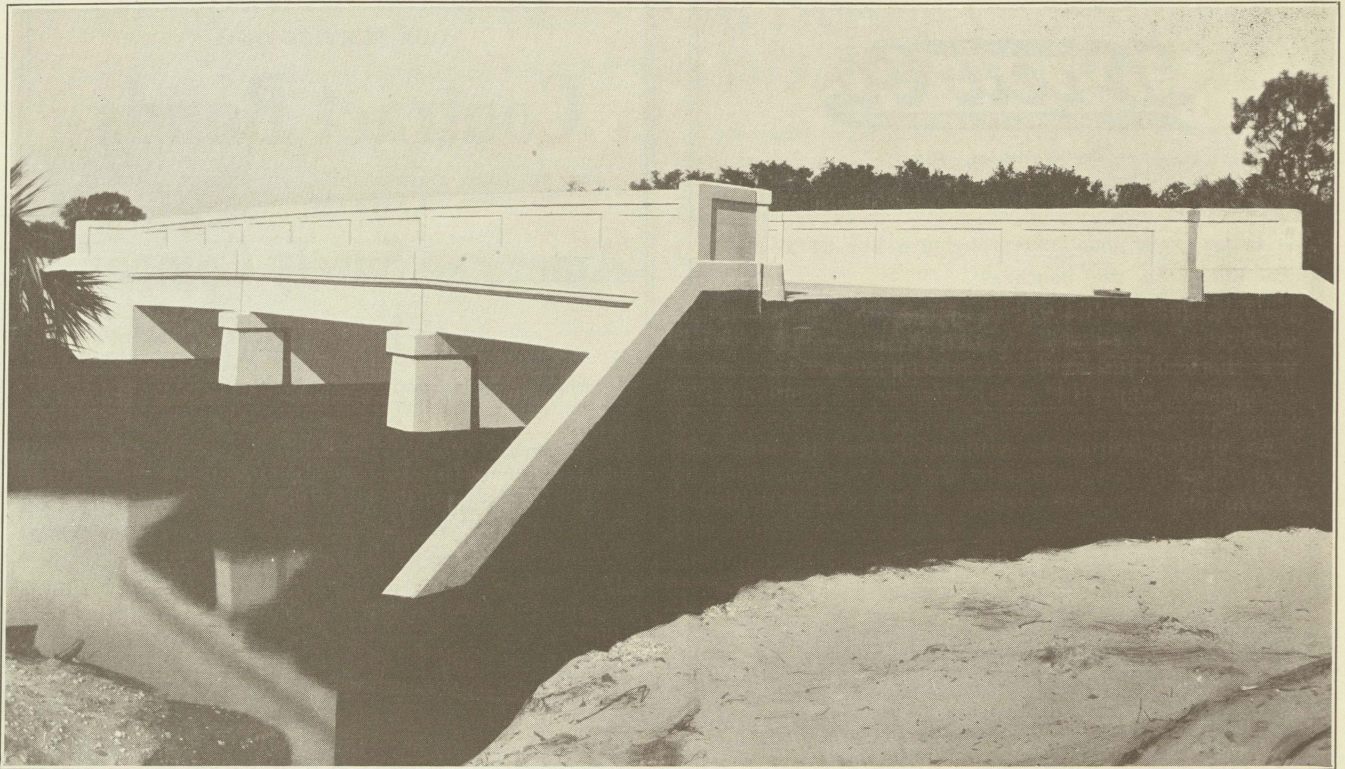
Ages of Highways

IN modern times we are wont to consider the improvement of road-beds for traffic a great innovation, but scholars assure us that almost since the dawn of history the value of good highways was considered a gain to a nation, and much money was spent for developments of this type. The modern cement dates down to more recent generations, but records indicate that in ancient Rome a material very much resembling our modern cement was used for sewers and paving.

As long as there have been cities there have been paved streets, and asphalt, which we think of usually as a modern product, was used in ancient Babylon by Nabopolassar, who was the first to use it for street construction. His son, Nebuchadnezzar, followed his example and upon one street of which he was particularly proud, caused his people to "traverse this street in joy" and wish him "eternal age and well being." Pompeii built sidewalks of asphalt and was the first to raise the center of her asphalt streets in order to drain off the water.

While these types of road construction had their early development in Babylon and the Roman Empire, Greece also produced an ancient road architecture. Very often in ancient Greece pavements were constructed with slabs of lava.

The earliest pavement in Central Europe was laid in Prague in 1333. By the end of the fourteenth century Bern, Rogensburg and Windberg, near Strasbourg, also had pavements. Nuremberg had no pavements until 1398. Up to then, Nuremberg had only paths made with logs. The Chancellor of Emperor



Project 641—Earman River Bridge—Road 4.

On the same day the item referred to appeared, a New York paper, in reporting the proceedings of the third World Motor Congress, attributed to the delegate from the Dutch East Indies a statement to the effect that motoring in Java is regarded as a hazardous adventure because of the frequent attacks upon touring cars by cows. This gentleman is quoted as having declared that cows grazing along the roadside take umbrage, as it were, when startled by the headlights of approaching automobiles, and wreak vengeance without regard to the consequences. This may possibly be explained by the fact that the oxcart is still the commercial and industrial competitor of motor vehicles in Java. It is barely probable that these objecting cows resent the possibility of the occupation of the sturdy masculine members of their families being taken from them by methods which permit only this somewhat undignified and unsatisfying form of redress.—Christian Science Monitor.

Highway Briefs

(From The Highway Magazine.)

WISCONSIN—The snow removal program carried out during the past winter embraced nearly 1,500 miles of state trunk highways and over 1,000 miles of county roads. During the previous winter 1,400 miles of state trunk roads were kept open at a cost of \$56,600.

FLORIDA—Contracts have been awarded by the state road department for the construction of 12 road projects, embracing a total of more than 100 miles, to cost in excess of \$1,500,000.

NEVADA—This great expanse of western country is setting many other states a stiff pace in roadbuilding. At the close of the 1926 season 71.3 per cent

of the Federal-aid system had been graded, or graded and surfaced, 1,075 miles in all. Nevada's population, by the way, is only about 80,000.

MINNESOTA—In six years 382 grade crossings have been eliminated from the important roads of the state.

OHIO—Over 1,800 white crosses, built of wood, mark the scenes of fatal accidents along Ohio's roads. Thirty per cent of these are at railroad grade crossings, 33 per cent are along straight sections of the road, while the remainder are at turns, hills, road intersections, and bridges. The crosses are believed to be a successful means of instilling caution in road users.

NEW JERSEY—Contracts have been awarded by the New Jersey highway commission for widening the White Horse Pike for 37 of the 60 miles of distance between Philadelphia and Atlantic City. The work for this year consists of constructing a ten or eleven-foot strip along the existing surfacing. With the subsequent addition of similar strips along the other side, this highway will have a width of 40 feet for its entire length. This widening has been needed since last summer when the completion of the Delaware River Bridge brought a great increase in traffic.

PENNSYLVANIA—The department of highways has published a folder entitled "Facts Motorists Should Know," which helps motorists and truck owners utilize the state highways to the fullest. The department believes that giving aid of this kind is a public service equivalent to building many additional miles of good roads, or, looking at it another way, is equivalent to cutting down the route distance between cities—full knowledge of roads saves the user's time, and makes him more of a booster.

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CHINESE AND AMERICAN CONTRASTS

(Compiled by a Chinese Student in the United States)

Whereas in China the husband divorces his wife and gets her dowry, in America the wife divorces her husband and gets his income.

Whereas in China a despairing wife threatens to hang herself, in America she threatens to shoot her husband.

Whereas in China people are interested in marriages when they are being made, in America they become of public interest only when they are being unmade.

Whereas in China white is worn by mourners, in America it is the color of the bridal dress.

Whereas in China one shakes one's own hand to congratulate oneself on the good fortune of meeting a friend, in America one shakes the other fellow's hand to congratulate the latter's good fortune in meeting oneself.

Whereas in China people pay the priests to say their prayers for them, in America people pay the priests and have to say the prayers with them, too.

Whereas in China teachers get at least ten times as much as a bricklayer, in America the latter gets more than the former.

Whereas in China they drink their liquor hot, in America they drink it with ice.

Whereas in China "toe" means the head, in America it means the other extremity of the body.

Whereas in China people take off their glasses in salutation, in America they take off their hats.

Whereas in China explanatory notes are put on top of the page and are therefore properly "head-

notes," in America such explanations become "foot-notes."

Whereas the Chinese in sewing push the needle away from them, the Americans push it toward them.

Whereas the Chinese compass points to the south, the American compass points to the north.

Whereas in China it is west-south, in America it is south-west.

Whereas in China surnames come first and given name next and "Mr." last, in America it is just the reverse.—From Literary Digest.

Henry Ford has deeded approximately seven miles of right of way to the Wayne County, Michigan, Highway Commission to enable that body to carry out its plan of constructing a comprehensive system of highways in the territory tributary and surrounding Detroit. Much of the right of way is for a new road which is to be 204 feet wide. The balance is given in order to provide for increasing the width of roads already existing of 204 feet.—Iowa Service Bulletin.

NATIONAL — Railroad operated motor trucks cover routes aggregating 611,921 miles, and motor buses, 352,800 miles, states a report gathered by the Interstate Commerce Commission.

The Michigan legislature is considering a bill that will, if passed, reduce auto license fees fully fifty percent, and the loss to the road fund from this source will be made up by a raise in the gasoline tax.

160,000 Persons Killed on Highways in 10 Years

The first note in a nation-wide highway safety campaign was struck at Chicago, January 20th, by Charles M. Upham, Managing Director of the American Road Builders' Association. In an address before a convention of the National Crushed Stone Association, Mr. Upham appealed to every man, woman and child in the United States to help make the campaign a success.

According to Mr. Upham, the automobile has taken more than 160,000 lives during the past ten years. In many places the fatalities are increasing faster than the number of automobiles are increasing, he said. During 1926 many metropolitan districts reported an increase of fifteen per cent in the loss of life over that of 1925.

"Final reports will unquestionably show that more than 25,000 persons were killed in automobile accidents during the year ending January 1st, 1927," Mr. Upham declared. "Most of these accidents were avoidable. The mortality can be cut in half within a short period of time if the people of this country will co-operate with the American Road Builders'

Association and each other in the campaign we are putting under way this year."

Mr. Upham said that careless and reckless driving and unfit drivers are responsible for the largest number of accidents, while poor lighting, complex traffic regulations, congestion, dangerous grade crossing, sharp curves, narrow bridges and other highway defects are additional hazards.

At the national convention of the American Road Builders' Association, which has just adjourned at Chicago, the problem of fatalities on the public streets and highways was given thorough consideration. It was decided to launch a campaign, the objective of which is the reduction of loss of life on the highways.

"If the Association can cut the loss of life on the highways in half, it will have saved more than 12,000 lives," Mr. Upham concluded. The safety campaign will be divided into three sections—statistical, engineering, and psychological.—The Nation's Highways.

A Billion For Roads

A huge highway construction and maintenance program entailing more than \$1,000,000,000 in the United States during 1927 was planned and urged by the American Road Builders' Association at their 24th annual convention held at Chicago, January 10 to 14, which was attended by 35,000 road men from every State in the United States and many North American countries. The need for speedy closing of gaps in the network of Federal aid highways was urged upon State Highway Commissioners by Thomas H. MacDonald, chief of the United States Bureau of Public Roads.

Traffic congestion on the highways demands that a third of the country's 3,000,000 miles of roadway be improved.

Congressional appropriations make \$85,000,000 available for distribution among the state commissioners this year, he pointed out. Of the 182,000 miles of highway called for in the Government program approximately 140,000 have been completed.

Mr. MacDonald lauded the progress of modern road making, asserting that the arteries being spread out today are far superior to the much-sung roads of ancient Rome.

Charles M. Upham, managing director of the association, said:

"Automobile registration is increasing thirteen per cent annually. At this rate we can expect fifty million motor cars to be in use in this country within twenty years. That will mean that the point of saturation in ownership has been reached—about one car for every three individuals.

"Construction of a super-highway system to take care of the traffic at that date will be urged at the convention with a view to instituting construction so that the system can be well along toward completion within a decade."

Mr. Upham did not venture any suggestions as to means of financing, nor as to the type of road. The plans recommended by the convention, he said, would be submitted to the people of the country as a suggested solution to the problem which will ar-

rive. "The decision is up to them. We'll tell them only how we think it can best be accomplished."

The possibility that construction of such a system would lead to decentralization of population was advanced by the engineer: "It is to be expected," he said, "that the construction of such a system will reverse the movement from country to city, due to the desirability of country residence.

"The type of road to be constructed would probably vary with the conditions of the location. In some places the roads would necessarily be of a width of 200 feet or more to take care of traffic at the saturation point.

"There is now only one such road in the country, that between Detroit and Pontiac, Michigan, which is 204 feet wide."

"The demand for more improved highways and for the widening and improvement of those already built was never greater in the history of the world," stated P. G. Shirley, of Richmond, Va., president of the association.

He further stated: "When the United States has completed a system of modern highways connecting the various cities in each state with trans-continental trunk lines, a great era of prosperity will be in effect.

"The influence of a system of highways properly constructed and maintained is so great that each of us has a responsibility to see that they are used for the betterment of mankind."

Mr. Shirley, who is chairman of the Virginia State Highway Commission, commended the gasoline taxes levied in many states as the best system for raising highway funds. Two hundred and fifty exhibits valued at over \$3,000,000 were displayed by manufacturers of building machinery and equipment in the coliseum on Wabash Avenue and educational displays by several states and Pan American countries were viewed on the fourth floor of the Palmer Hotel where headquarters of the four-day convention were located.—Michigan Roads and Pavements.

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a tremendous capacity, adequate for any job. And every pound is clean aggregate. Washed, screened and sized. Let us figure with you now for that next job!

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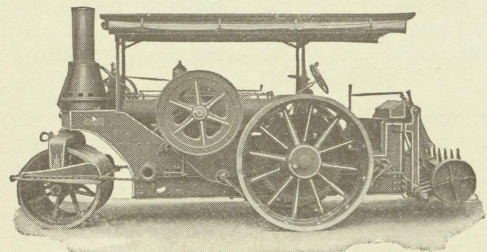
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THE LEGISLATURE

The Legislature of Florida which meets in April will have many important problems to consider.

We are told that over three-fourths of the members are of the intensely progressive kind—that means they are anxious to do big things that will advance Florida's interests.

Governor Martin has most constructive plans and his ideas will be carried out. The most important things constitute: Everglade drainage, Educational advancement, Continuance of the highway program, a state advertising bureau, Regulation of dance halls and motion pictures, Encouragement of manufacturing interests, stimulation of agriculture. — The Floridian.

If a girl guest can't stay more than five days, it is because she has only five frocks.—Ex.

Even as You and I

A fool there was who had worked like heck,

Even as you and I.

He saved his dough till he had a peck

Then he bought an auto, and made a wreck

Of his hard-earned dough which he had a peck,

And now he's in debt clear up to his neck,

Even as you and I.

"We pay for good roads whether we have them or not, and pay more when we do not have them, for a good road, after it is improved, pays for itself many times over."—Thomas H. MacDonald.

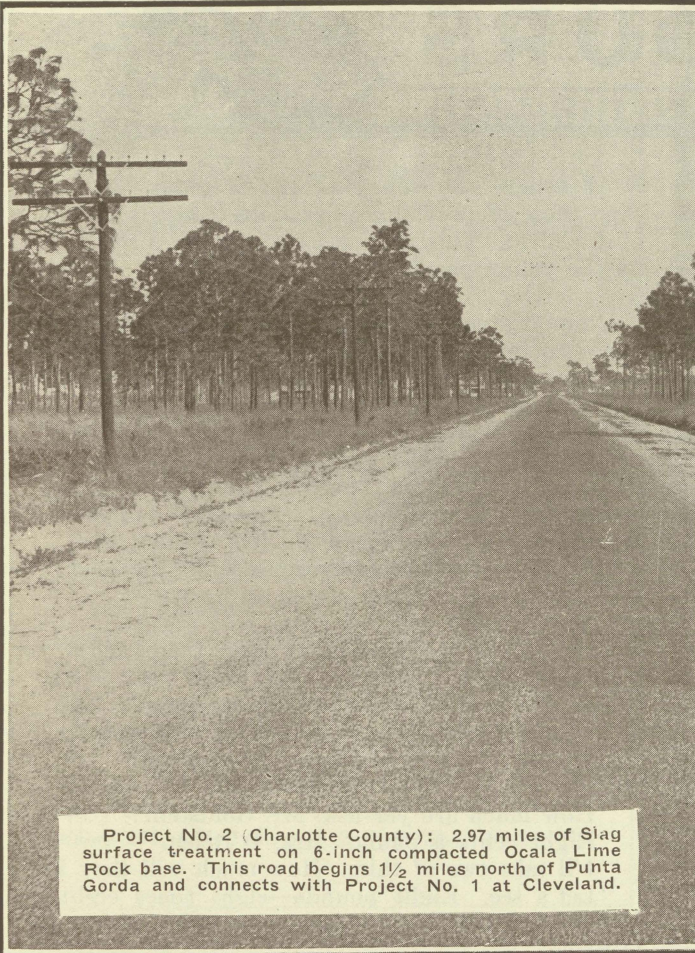
At the Fire Sale

Customer—"Are you sure this suit won't shrink if it gets wet?"

Mr. Epstein—"Mine friendt, effery fire company in dis city has squirted water on dot suit."—Ex.

Contracts Awarded by State Road Department January 1st, 1927, to April 5th, 1927

| Contractor | Project No. | County | Length Miles | Length Feet | Contract Plus 10% | Type |
|------------------------------|-------------|-----------------|-----------------|----------------|----------------------|----------------|
| Noonan-Lawrence | 54 | Leon | 13.00 | .... | \$ 385,297.67 | Concrete |
| Higgison Const. Co. | 59 | Leon-Jefferson | 9.10 | .... | 266,053.37 | Concrete |
| Duval Engr. & Contr. Co. | 54-A & 58 | Leon-Jefferson | 12.53 | .... | 264,524.48 | R. B. S. T. |
| Manley Constr. Co. | 53-A | Lake | 7.10 | .... | 249,034.28 | Asph. Conc. |
| W. J. Bryson Paving Co. | 52 | Escambia | 10.089 | .... | 241,904.49 | C. G. & G. |
| Boone & Wester | 677-C | Levy | 10.16 | .... | 224,345.88 | C. G. & G. |
| Thompson & Moseley, Inc. | 677-D | Levy | 7.58 | .... | 66,017.34 | C. G. & G. |
| Lake Worth Const. Co. | 683-C | Palm Beach | 8.27 | .... | 44,290.95 | C. G. & G. |
| B. Booth & Co. | 687-B | Lake | 15.22 | .... | 89,496.93 | C. G. & G. |
| C. T. Dawkins | 50-A | Putnam | .... | 120 | 22,243.32 | Conc. Overhead |
| Okeechobee Const. Co. | 655-667 | Highlands | .... | 815 | 50,006.45 | Timber |
| C. H. Turner Co. | 697 | Escambia | .... | 488 | 22,911.53 | Timber |
| Duval Engr. & Contr. Co. | 571 | Madison | 14.26 | .... | 47,190.03 | S. T. |
| Langston Const. Co. | 660 | Clay | 10.52 | .... | 33,538.07 | S. T. |
| H. E. Wolfe | 48 | St. Johns | 15.39 | .... | 371,253.82 | R. B. |
| Nelson Brothers | 694 | Martin | 8.48 | .... | 275,185.30 | Concrete |
| Johnson, Drake & Piper.. | 693 | St. Lucie | 8.93 | .... | 312,662.92 | Concrete |
| Concrete Steel Bridge Co. | 665 | Clay | .... | 1400 | 208,167.96 | Concrete |
| Concrete Steel Bridge Co. | 664 | Clay | .... | 1600 | 236,366.90 | Concrete |
| Royce Kershaw, Inc. | 640-B | Martin | .... | 131 | 32,201.40 | Concrete |
| F. M. Stuart & Co. | 40-B | Brevard | .... | 108 | 40,149.91 | Concrete |
| Langston Const. Co. | 641 | Palm Beach | 9.67 | .... | 188,279.21 | R. B. |
| Samuel Vadner | 695 | Lake | 10.50 | .... | 63,734.69 | C. G. & G. |
| Tampa Sand & Shell Co. | 695 | Lake | .... | .... | 63,368.28 | Hyd. Fill |
| R. C. Huffman Const. Co. | 669-D | Dade | 12.30 | .... | 382,038.36 | C. G. & G. |
| Deen, Yarborough & Ebersbach | 685 | Franklin | 17.43 | .... | 159,980.86 | C. G. & G. |
| Wm. P. McDonald Const. Co. | 648 | Hardee | 7.14 | .... | 24,075.97 | S. T. |
| L. M. Gray | 676-B | Levy | 24.35 | .... | 80,637.57 | S. T. |
| West Construction Co. | 614 | Sarasota | 17.34 | .... | 483,586.35 | Bit. Conc. |
| Manley Construction Co. | 687-A | Lake | 15.00 | .... | 436,551.76 | Sheet Asph. |
| M. C. Winterburn, Inc. | 543 | Seminole | 14.20 | .... | 405,296.30 | Bit. Mac. |
| Wm. P. McDonald Const. Co. | 648 | Hardee | 6.36 | .... | 123,804.83 | R. B. S. T. |
| Duval Engr. & Constr. Co. | 659 | Clay | 2.80 | .... | 49,310.97 | R. B. S. T. |
| C. A. Steed & Sons Co. | 668 | Brevard | 13.45 | .... | 373,640.32 | R. B. S. T. |
| Stidham & Hughes | 564-C | Charlotte | 3.93 | .... | 81,173.55 | R. B. S. T. |
| H. L. Clark & Sons Co. | 676-C | Levy | 15.01 | .... | 227,110.22 | R. B. S. T. |
| F. X. Bradley & Co. | 573-D | Orange | 16.81 | .... | 95,642.25 | C. G. & G. |
| C. A. Henderson | 713 | Columbia | 10.00 | .... | 85,284.71 | C. G. & G. |
| James Betteridge | 41-B | Dade | .... | 88 | 42,387.84 | Concrete |
| Peterson & Earnhart | 698 | Leon | .... | 400 | 34,773.06 | Concrete |
| Peterson & Earnhart | 699 | Jefferson | .... | 300 | 27,441.17 | Concrete |
| John J. Quinn, Inc. | 641 | Palm Beach | 1.00 | .... | 52,494.31 | S. T. |
| Board Co. Commrs. Taylor Co. | 745 | Taylor | 14.00 | .... | 12,320.00 | C. & G. |
| Finlayson & Morris | 747 | Jefferson | 6.50 | .... | 40,566.79 | C. G. & G. |
| C. S. Maulsby | 694 | Martin | .... | .... | 10,780.00 | Protection |
| Kibbey Engineering Co. | 663-679 | Citrus-Hernando | 15.00 | .... | 19,145.28 | Guard Rail |
| Totals | | | 383.41 | 5,450 | \$7,046,267.65 | |



Project No. 2 (Charlotte County): 2.97 miles of Slag surface treatment on 6-inch compacted Ocala Lime Rock base. This road begins 1½ miles north of Punta Gorda and connects with Project No. 1 at Cleveland.

93 Miles of Slag Surface Treated Roads in one Florida County

Asphalt and Slag surface treatment wearing surface—on a compacted Ocala Lime Rock Base! Last year Florida's road building program included more than THREE MILLION sq. yds. of "non skid"

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Photo shows one of several large projects (totalling 93 miles) completed recently in Charlotte County by the Broadbent Construction Co.

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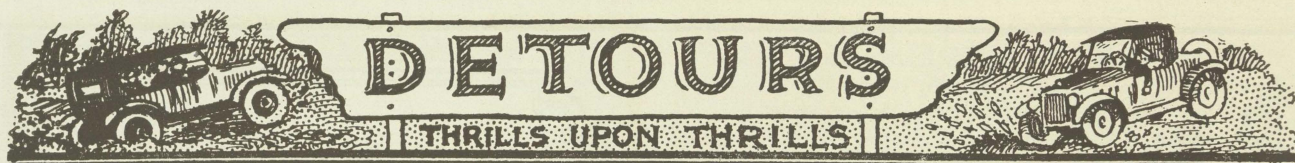
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And you don't see any cops in the street anymore; they are up in little towers—they are afraid to come down.—House Dope.

If a train is spoken of as "she," be gallant enough to let the lady pass the next time you come to a railroad crossing.—D. M. & N. R. R.

Exterior Decoration

Clarice—"Don't you think George dresses natively?"

Maurice—"Natalie who?"—Judge.

He May Be Right

INSPECTION FEES SHOW DECREASE
Walter Putnam Blames Lack of Increase.

—Pasadena paper.

Chesterfieldian Papa

The man and the girl were saying good-night on the doorstep when a window above them was pushed suddenly open and a weary voice said, "My dear sir, I have no objection to your coming here and sitting up half the night with my daughter, nor even your standing on the doorstep for two hours saying good-night, but out of consideration for the rest of the household who wish to go to sleep, will you kindly take your elbow off the bell-push?"—Pennsylvania Farmer.

Odd Beads

Messrs. Harrington and Thompson suffered badly frozen feet, due to wearing oxfords, frosted ears and fingers.—North Dakota paper.

Willing to Listen

Money talks, and most of us wish we were in a position to be bored by it.—Boston Transcript.

Where Desire is Drowsy

Nothing works out right. In a town where you can park as long as you want to there is no reason why you should want to.—Birmingham News.

Girl's Essay On Men

From a schoolgirl's composition: "There are three kinds of men—husbands, bachelors and widowers. An eligible bachelor is a mass of obstinacy surrounded by suspicions. Husbands are of three varieties—prizes, surprises and consolation prizes. A widower is a man someone has rescued as he goes down for the third time. Making a husband of a bachelor is one of the highest plastic arts known to civilization. It requires science, sculpture, common sense and faith, hope and charity, especially charity.—Ex.

Naught from Seven

Teacher—"Robert, here is an example in subtraction. Seven boys went down to the creek to bathe, but two of them had been told not to go in the water. Now, can you inform me how many went in?"

Robert—"Yes'm; seven."—Lancashire Daily Post.

"I believe the young people of today are better than those of previous generations," says the Bishop of Lichfield. This confirms the opinion already held by the young people of today.—Punch.

Cosmeticians disagree as to whether the bob is passing. Our opinion is that the passing of the bob is like the passing of the buck. It will continue to pass, but we shall never be rid of it entirely.—Chicago Daily News.

Let the Tragedy Proceed

Persistent Young Man—"I love your daughter, sir—and what is more, I can not live without her!"

Her Father—"Then why come bothering me? I'm not an undertaker!"—London Opinion.

The One on the Ground—"Hey, there, lady, you just ran over my foot!"

The One in the Car—"Oh, I'm so sorry."

"That's all right, lady, I have another one."

The Irish Dividend

"How much are yer fish, Mr. Goldstein?"

"Eight cents a pound, Mrs. O'Brien."

"I'll take two of thim. How much will they be?"

"Let's see. Eight pounds—eight times eight are eighty-eight. Take 'em for seventy-five cents, Mrs. O'Brien."

"Thank ye, Mr. Goldstein, I'll do that. Ye're always good to the Irish—I'll say that for ye."

And the trade was closed.

"I think I can make it," said Father to Ann, "now the flivver's in pieces, and so's her old man."—The Box Car.

Boston's Traffic Jam

Motor Cop (to professor of mathematics)—"So you saw the accident, sir. What was the number of the car that knocked this man down?"

Professor—"I'm afraid I've forgotten it. But I remember noticing that if it were multiplied by fifty, the cube root of the product would be equal to the sum of the digits reversed."—Boston Transcript.

Professionals

A widower was to be married for the third time, and his bride had been married once before.

The groom-elect wrote across the bottom of the wedding invitation sent to a friend:

"Be sure to come; this is no amateur performance."

Poetical Sympathy

A son at college wrote to his father:

"No mon, no fun, your son."

The father answered:

"How sad, too bad, your dad."—American Boy.

Perhaps the convincing answer to the philosopher who argues that wars are necessary to reduce the surplus population would be to include him in the surplus population.—Detroit News.

Jack Camp, E. F. Fitch, Clarence Camp,
President, Vice-President, Sec. and Treas.

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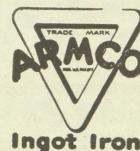
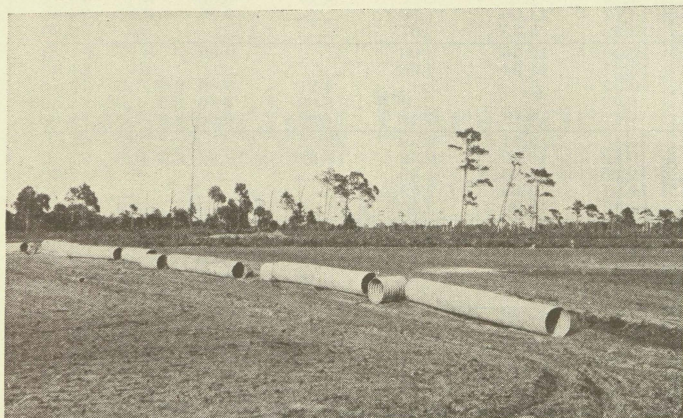
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When 150 feet of 18" Armco Culvert was laid in this small creek at
Venice, Florida, the work took about one-sixth the time that would have
been needed to install rigid type of pipe—and the engineers knew
they were installing the culvert of greatest permanency.

For strength, long life and low cost, use ARMCO for road culverts

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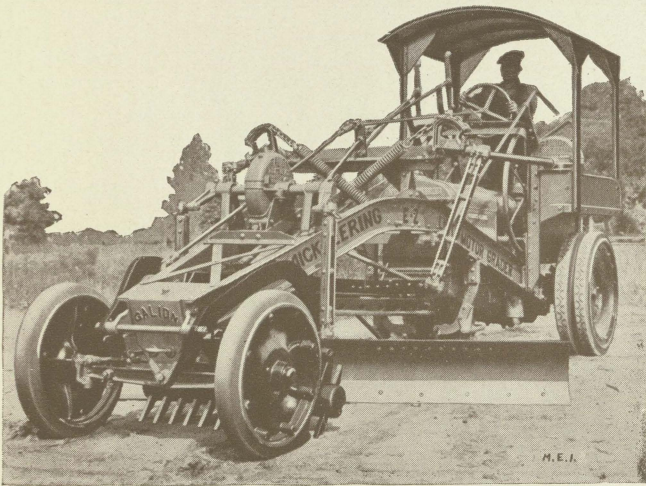
THROUGH JANUARY 31, 1927.

| Proj. No. | Contractor | Road No. | County | Total Length Miles | Clearing Miles | Grading Miles | Base Miles | Surface Miles | Type | Per Cent Complete |
|------------------------------------|-------------------------------|----------|----------------|--------------------|----------------|---------------|------------|---------------|----------|-------------------|
| 1 | State Convict Forces | 1 | Okaloosa | 6.08 | 0.00 | 0.00 | | | G. | 0.00 |
| 7 | Duval Engr. & Contr. Co. | 2 | Hamilton | 13.00 | | | 13.00 | 13.00 | S.T.R.B. | 100.00 |
| 37-D | L. M. Gray | 2 | Alachua | 2.14 | | | 2.14 | 2.14 | S.T.R.B. | 100.00 |
| 41 | Morgan-Hill Paving Co. | 4 | Dade | 12.00 | 12.00 | 11.64 | 11.40 | 2.80 | S.A. | 83.00 |
| 46 | McMahan Const. Co. | 3 | Nassau | 11.51 | | | | .92 | Conc. | 8.00 |
| 47 | J. B. McCrary Engr. Corp. | 4 | St. Johns | 14.96 | | | | 0.00 | Conc. | 0.00 |
| 48 | A. J. Hoffman | 4 | St. Johns | 15.94 | 15.94 | 15.94 | | | G. | 100.00 |
| 49 | A. J. Hoffman | 4 | Flagler | 13.81 | 13.53 | 10.36 | | | G. | 83.00 |
| 50-A | Boone & Wester | 14 | Putnam | 6.18 | 4.45 | 1.92 | | | G. | 5.50 |
| 50-B | B. Booth & Co. | 14 | Putnam | 9.78 | 9.78 | 8.80 | | | G. | 80.40 |
| 50-C | E. Roy James | 14 | Putnam | 10.03 | 9.53 | 6.52 | | | G. | 67.70 |
| 52 | W. J. Bryson Paving Co. | 1 | Escambia | 10.09 | 0.00 | 0.00 | | | G. | 0.00 |
| 53-A | B. Booth & Co. | 2 | Lake | 7.10 | 6.89 | 6.89 | | | G. | 97.50 |
| 53-A | Manley Constr. Co. | 2 | Lake | 7.10 | | | 0.00 | 0.00 | B.C. | 0.00 |
| 53-C | Tampa Sand & Shell Co. | 2 | Lake | 1.87 | .92 | .32 | | | G. | 16.70 |
| 54 | Noonan-Lawrence | 1 | Leon | 13.00 | | | | 0.00 | Conc. | 0.00 |
| 58 | Duval Engr. & Constr. Co. | 1 | Leon-Jefferson | 12.53 | | | 0.00 | 0.00 | S.T.R.B. | 0.00 |
| 59 | Higgison Const. Co. | 1 | Jefferson | 9.10 | | | | 0.00 | Conc. | 0.00 |
| 500-A | Noonan-Lawrence | 20 | Bay | 9.65 | 9.65 | 9.65 | | 8.00 | Conc. | 85.00 |
| 502 | State Convict Forces | 10 | Gulf | 7.50 | | | 0.00 | 0.00 | S.T. | 0.00 |
| 514 | State Convict Forces | 1 | Jackson | 11.04 | 10.49 | 10.49 | | 7.28 | S.C. | 81.60 |
| 529 | M. C. Winterburn, Inc. | 1 | Suwannee | 12.70 | | | | 3.80 | Conc. | 31.00 |
| 533 | Baker & Foulks, Inc. | 1 | Suwannee | 13.31 | | | 7.54 | 4.00 | S.R.R.B. | 55.10 |
| 543 | Lake Worth Const. Co. | 3 | Seminole | 14.20 | 13.78 | | | | G. | 80.00 |
| 564-B | Broadbent Const. Co. | 5 | Charlotte | 9.73 | | | 9.73 | 3.00 | S.T.R.B. | 94.00 |
| 564-C | E. F. Powers Const. Co. | 5 | Charlotte | 3.94 | 3.94 | 3.35 | | | G. | 92.00 |
| 565 | Johnson, Drake & Piper, Inc. | 1 | Madison | 15.99 | | | | 11.19 | Conc. | 69.80 |
| 571 | Duval Engr. & Contr. Co. | 1 | Madison | 14.26 | | | 7.84 | 0.00 | S.T.R.B. | 54.00 |
| 580 | State Convict Forces | 19 | Dixie | 28.50 | 6.00 | 6.00 | | 0.00 | S.T.R.B. | 20.00 |
| 587 | C. G. Kershaw Const. Co. | 5-A | Columbia | 4.38 | 1.31 | 1.31 | | | G. | |
| 589 | H. E. Wolfe | 5 | Lee | 8.16 | | | 8.16 | 6.00 | S.T.R.B. | 99.00 |
| 590 | State Convict Forces | 1 | Santa Rosa | 9.28 | 0.00 | 0.00 | | | G. | 0.00 |
| 592 | U. S. Fidelity & Guaranty Co. | 10 | Franklin | 7.89 | 1.65 | 1.10 | | | G. | 13.00 |
| 609 | Wm. P. McDonald Const. Co. | 2 | Hardee | 1.52 | 1.52 | 1.52 | 1.52 | 1.52 | S.T.R.B. | 100.00 |
| 614 | W. J. Bryson Paving Co. | 5 | Sarasota | 17.07 | 17.07 | 10.24 | | | G. | 64.00 |
| 619 | J. L. Gladwell | 5 | Alachua | 9.28 | 7.89 | 3.71 | | | G. | 49.60 |
| 621 | Penton-Mathis Const. Co. | 1 | Okaloosa | 19.64 | 19.64 | 18.85 | | | G. | 92.00 |
| 623 | State Convict Forces | 35 | Madison | 12.91 | 12.91 | 12.65 | | | S.C. | 72.30 |
| 640-A | S. J. Groves & Sons Co. | 4 | Martin | 9.00 | 0.00 | 0.00 | | | G. | 0.00 |
| 640-B | Lake Worth Const. Co. | 4 | Martin | 11.80 | 0.00 | 0.00 | | | G. | 0.00 |
| 641-A | Chas. F. Wilmore | 4 | Palm Beach | 11.36 | 11.00 | 11.00 | | | G. | 90.00 |
| 648 | Southern Surety Co. | 2 | Hardee | 14.17 | 14.17 | 14.00 | | | G. | 95.00 |
| 648 | Wm. P. McDonald Const. Co. | 2 | Hardee | 7.14 | | | 3.21 | 0.00 | S.T. | 40.50 |
| 651 | State Convict Forces | 10 | Gulf | 14.72 | 14.00 | 11.50 | | 0.00 | S.C. | 39.00 |
| 653 | H. D. Spangler | 4 | Broward | 13.46 | 5.38 | .67 | | | G. | 6.80 |
| 657 | State Convict Forces | 6 | Jackson | 10.00 | 10.00 | 9.00 | | 0.00 | S.C. | 90.00 |
| 659 | M. C. Winterburn, Inc. | 3 | Clay | 13.27 | 11.94 | 2.65 | | | G. | 44.00 |
| 660 | Langston Const. Co. | 3 | Clay | 10.52 | | | 4.21 | 0.00 | S.T.R.B. | 37.00 |
| 663 | Wm. P. McDonald Const. Co. | 5 | Citrus | 8.03 | | | 8.03 | 4.00 | S.T.R.B. | 95.89 |
| 667 | H. E. Wolfe | 18 | DeSoto | 8.63 | 8.19 | 7.16 | 4.23 | 0.00 | S.T.R.B. | 80.00 |
| 668 | E. F. Powers Const. Co. | 4 | Brevard | 13.45 | 12.91 | 6.59 | | | G. | 66.00 |
| 669-B | M. C. Winterburn, Inc. | 27 | Dade | 10.32 | 10.32 | 10.32 | 10.32 | 10.32 | S.T.R.B. | 97.00 |
| 669-C | R. C. Huffman Const. Co. | 7 | Dade | 12.00 | 4.50 | 1.80 | | | G. | 12.50 |
| 669-V | Alexander, Ramsey & Kerr | 27 | Collier | 11.91 | 9.00 | 7.50 | | | G. | 62.45 |
| 669-V | State Convict Forces | 27 | Collier | 15.40 | 6.00 | 5.50 | 4.50 | 0.00 | S.T.R.B. | 29.00 |
| 669-X | Alexander, Ramsey & Kerr | 27 | Collier | 9.39 | 9.39 | 8.92 | | | G. | 95.50 |
| 673 | State Convict Forces | 1 | Gadsden | 14.87 | 14.00 | 12.00 | | 8.00 | S.C. | 80.00 |
| 674 | Nelson Brothers | 1 | Duval | 3.50 | 2.80 | 2.80 | | 0.00 | Conc. | 7.38 |
| 675 | Wm. P. McDonald Const. Co. | 17 | Polk | 5.16 | 5.16 | 5.16 | 5.16 | 5.16 | S.A. | 100.00 |
| 676-A | L. M. Gray | 19 | Levy | 9.96 | | | 1.69 | 0.00 | S.T.R.B. | 15.00 |
| 676-B | McLeod Const. Co. | 19 | Levy | 14.34 | 14.39 | 13.40 | | | G. | 90.00 |
| 676-B | L. M. Gray | 19 | Levy | 14.39 | | | 4.46 | 0.00 | S.T.R.B. | 27.90 |
| 676-C | Langston Const. Co. | 19 | Levy | 15.02 | 15.02 | 7.51 | | | G. | 57.00 |
| 677-A | A. J. Hoffman | 13 | Levy | 6.96 | 6.96 | 4.73 | | | G. | 71.00 |
| 677-B | Coastal Const. Co. | 13 | Levy | 11.58 | 3.24 | 1.50 | | | G. | 17.50 |
| 677-C | Boone & Wester | 13 | Levy | 10.16 | 0.00 | 0.00 | | | G. | 0.00 |
| 677-D | Thompson & Moseley, Inc. | 13 | Levy | 7.58 | 0.00 | 0.00 | | | G. | 0.00 |
| 679 | Wm. P. McDonald Const. Co. | 5 | Hernando | 7.12 | | | 7.12 | 0.00 | S.T. | 96.94 |
| 682 | L. B. McLeod Const. Co. | 5 | Citrus | 6.46 | | | 6.46 | 6.46 | S.T.R.B. | 100.00 |
| 683-C | Lake Worth Const. Co. | 4 | Palm Beach | 8.27 | 0.00 | 0.00 | | | G. | 0.00 |
| 687-A | E. W. Ellis | 2 | Lake | 15.00 | 15.00 | 12.00 | | | G. | 86.00 |
| 687-B | B. Booth & Co. | 2 | Lake | 15.22 | 0.00 | 0.00 | | | G. | 0.00 |
| 691 | Mason Payne Co., Inc. | 4 | Indian River | 5.52 | 4.14 | 1.38 | | | G. | 33.00 |
| 692 | Boone & Wester | 4 | St. Lucie | 7.38 | 5.53 | 1.40 | | | G. | 29.70 |
| 693 | Boone & Wester | 4 | St. Lucie | 8.73 | 8.64 | 8.03 | | | G. | 67.00 |
| 694 | C. A. Steed & Sons | 4 | Martin | 8.48 | 8.48 | 8.22 | | | G. | 97.00 |
| 698 | Curtis & Gubbins | 19 | Leon | 12.43 | 2.61 | 1.86 | | | G. | 12.70 |
| 699 | State Convict Forces | 19 | Jefferson | 7.71 | 5.70 | 3.50 | | | G. | 40.00 |
| 718 | C. G. Kershaw Const. Co. | 5-A | Columbia | 8.22 | 3.94 | 3.29 | | | G. | 34.80 |
| 721 | L. M. Gray | 3 | Putnam | 4.50 | 1.50 | 1.50 | 1.50 | 0.00 | S.T.R.B. | 20.00 |
| 771 | J. B. McCrary Engr. Corp. | 4 | Duval | .59 | 0.00 | 0.00 | | 0.00 | Conc. | 0.00 |
| Total Complete January 31, 1927 | | | | 1848.20 | 1764.37 | 792.51 | 1288.53 | | | |
| Complete Month of January | | | | 35.54 | 41.72 | 22.75 | 45.49 | | | |
| Total complete December 31st, 1926 | | | | 1812.66 | 1722.65 | 769.76 | 1243.04 | | | |

TOTAL MILEAGE COMPLETE

| | Concrete | Brick | B. C. | S. A. | B. M. | Asph. Block | S. T. | S. C. | Marl | Total |
|---------------------------|----------|-------|-------|-------|-------|-------------|--------|--------|-------|---------|
| Complete to Dec. 31, 1926 | 138.01 | 17.13 | 10.73 | 75.86 | 84.04 | 23.20 | 564.89 | 400.12 | 27.58 | 1346.40 |
| Complete month of Jan. | 8.58 | | | .91 | | | 21.11 | 2.62 | | 33.22 |
| Total to Jan. 31, 1927 | 146.59 | 17.13 | 10.73 | 76.77 | 88.84 | 23.20 | 586.00 | 402.78 | 27.58 | 1379.62 |

NOTE: Types summarized as of January 1st, 1927



Modern Road Maintenance

Galion Motor Graders form a complete line of modern perfected machines, with either McCormick-Deering or Fordson power. They can be equipped with scarifiers, with Galion crawlers and with 8, 10, 12, or 14 foot mouldboards.

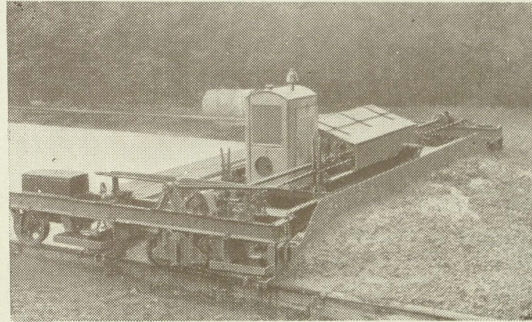
If you want facts and prices on the best road graders and road rollers of all types that the market affords, write us today.

**The Galion Iron Works & Mfg. Company
of Florida**

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The ORD Concrete Road Finisher Leaves No Bubbles in the Road



Through correct compacting, stones and pebbles are caught by the front edge of the screed and rolled, or squeezed down into the mass of concrete. The result is a forcing out of all air and water pockets from the pavement. So thoroughly is this done that the pavement will not break down when subjected to the heaviest traffic.

Send for complete information

A. W. French & Company

Manufacturers of the ORD Concrete Road Finisher

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Chicago, Ill.

Reinforcing Bars for Concrete

*Made in the United States
from new billet steel.*

*Intelligent, dependable service
by expert bridgemen.*

Dudley Bar Company

BIRMINGHAM, ALA.

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Brick pavements have protected Florida's investments in paved streets and highways beyond all other materials. The brick pavement lasts long years after the bonds are paid off and forgotten.

**SOUTHERN CLAY
MANUFACTURING COMPANY**

Chattanooga

Tenn.

Makers of Paving Brick for 35 Years

Plants

Robbins, Tenn., Coaldale and N. Birmingham, Ala.

It's a Long Hard Grind ^{for} the Streets of Today

TRAFFIC is merciless! Day and night the rush and pressure—grinding away at the surface, testing the heart of the base—trucks, buses, passenger cars, trailers—constantly varying weights, from pounds to tons!

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Lime-Rock lasts!

That is why the Government approves Lime-Rock for Federal highways; that is why the State of Florida approves it, and that is why some of the most trustworthy testing laboratories give Lime-Rock the stamp of "Tested and accepted."

If you know an experienced street and highway contractor, he can tell you why Lime-Rock is better, even though low in cost. Or, for such information as you would like to have address the headquarters office. You will be interested in learning why——

Such is the chemical composition of Lime Rock, it is its own binder and substance under pressure, an economy of special importance in building long-lasting roads rapidly.

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